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Voorwoord

In het orthopedische landschap komt het woord PROM steeds meer voor. Verzekeraars gebruiken PROM's om inkoop van zorg te sturen, patiënten kiezen hun dokter op basis van PROM's en dokters moeten zich verantwoorden voor hun acties door middel van PROM's. Meten PROM's wat wij willen weten of is het meten zonder te weten wat we eigenlijk meten? Een veel gehoorde zinsnede is: "we doen aan PROM's dus we doen aan research" of "we vragen aan de patiënt hoe ze het vonden gaan en dat is toch ook een PROM" of "we hoeven niet aan PROM's te doen, we doen al aan research".

In al deze stellingen zit zeker een kern van waarheid, maar daarnaast ook veel onjuistheden. Het vragen naar PROM's is iets wat inherent aan ons vak is verbonden, wij willen namelijk de uitkomst voor de patiënt verbeteren. Om dat te kunnen doen zullen wij ons goed moeten realiseren wat de patiënt eigenlijk wil. Er zijn onderzoeken die aantonen dat de patiënt toch relatief vaak anders denkt dan de orthopeed over wat met een behandeling verbeterd kan en zou moeten worden. Het is dus zaak te vragen naar wat de patiënt wil en verwacht. Dit deel van de PROM's zit er in orthopedisch Nederland al aardig in, het registreren, bijhouden en eventueel zelfs bijstellen van beleid naar aanleiding van PROM's is toekomstmuziek.

In deze editie van het NTvO daarom aandacht voor deze metingen van patiëntgeoriënteerde uitkomsten. In een uitgenodigde instructional course kunt u meer over de theorie rondom de keuze van de PROM lezen.


Verder leest u een ingezonden manuscript wat duidelijk maakt dat er met betrekking tot de praktische uitvoering van PROM's nog veel werk verzet moet worden. In de LROI is het registreren van de PROM naast de patiënt- en prothesekenmerken ook een hot item.

Ter afsluiting van dit voorwoord wil ik namens de redactie nog dank uitspreken aan Rudolf Poolman die, naast zijn werk aan PROM's in de orthopedie, ook een stempel heeft gezet op het NTvO door de PICO rubriek in het leven te roepen. Rudolf heeft de redactie nu verlaten en Loes Janssen uit Venlo heeft zijn plek ingenomen.

Dr. Taco Gosens, hoofdredacteur

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De Vereniging heeft als doel:

- Het bevorderen van studie en het verbreiden van kennis van de conservatieve en operatieve orthopedie onder artsen.
- Het behartigen van de sociale belangen van de artsen die de orthopedie uitoefenen, zowel binnen de vereniging als daar buiten.

Het Nederlands Tijdschrift voor Orthopaedie is het officiële orgaan van de Nederlandse Orthopaedische Vereniging. Het heeft ten doel de leden van de Vereniging en andere geïnteresseerden te informeren over ontwikkelingen op orthopedisch gebied, waarbij zowel klinische als fundamentele aspecten worden belicht. Deze doelstelling wordt verwezenlijkt in de vorm van oorspronkelijke artikelen, editorials en verslagen van wetenschappelijke vergaderingen, met name die van de NOV. Naast verenigingsnieuws wordt ook aandacht besteed aan recent verschenen literatuur en proefschriften. Voorts worden congressen, symposia en workshops op het gebied van de orthopedie aangekondigd.

Beweringen en meningen, geuit in de artikelen en mededelingen in deze publikatie, zijn die van de auteur(s) en niet (noodzakelijkerwijs) die van de redactie. Grote zorgvuldigheid wordt betracht bij de samenstelling van de artikelen. Fouten (in de gegevensverwerking) kunnen echter niet altijd voorkomen worden. Met het oog hierop en omdat de ontwikkelingen in de medische wetenschap snel voortschrijden, wordt de lezer aangeraden onafhankelijk inlichtingen in te winnen en/of onderzoek te verrichten wat betreft de vermelde diagnostische methoden, doseringen van medicijnen, enz. De redactie wijst elke verantwoordelijkheid of aansprakelijkheid voor (de juistheid van) dergelijke gegevens van de hand en garandeert noch ondersteunt enig produkt of enige dienst, geadverteerd in deze publikatie, noch staat de redactie garant voor enige door de vervaardiger van dergelijke produkten gedane bewering.

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The choice determines the success: PROMs

Jolanda de Vries and Brenda den Oudsten

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Introduction

Patient-reported outcomes (PROs) have gained importance in clinical practice and medical research. This growing interest is related to the shift in attention from doctor-oriented to patient-oriented medicine. Moreover, in recent years, the audience with an interest in PROs has broadened. Not only patients and clinicians are interested in PROs, but also regulators, policy makers and health technology assessment authorities. The goal is to ensure the best outcome for patients after treatment or for making decisions about product approval.

PROs are assessed with patient-reported outcome measures (PROMs). There is a plethora of questionnaires, which can be used as PROMs. It can be quite difficult to choose questionnaires, because there are several aspects that should be taken into account. Although PROMs are often selected because they are commonly used or are available in a wide range of languages, such factors are not the only factors to consider and may even be minimal compared to other factors. For instance, the most essential questions to be answered are 'what do we intend to measure?', 'in which target population?', and 'for which purpose?'. Moreover, another important aspect is 'how good are the psychometric properties of PROMs?'. It is important to answer these questions adequately, since choosing the 'wrong' PROM may lead to disappointment and wrong use of interpretation of data. The Dutch Orthopedic Association (Nederlandse Orthopaedische Vereniging; NOV) has formulated and chosen criteria for suitable PROMs.¹ A step that precedes this is the question of what each PROM exactly measures and

more importantly, what you want to know, before even choosing a measure. In this overview, we will discuss the concepts PRO and PROMS and discuss how to choose the 'right' PROMS.

The concept PRO

PROs can be measured directly from patients about how they function or feel in relation to a health condition and/or its treatment without interpretation from another person.² Patients' evaluations can be obtained through interviews, self-report questionnaires, and diaries. As such, proxy reports from caregivers or clinicians cannot be considered PROs. PROs should not be confused with patient-based outcomes. The latter implies that the issues covered are specific concerns of patients. This is not a prerequisite of PROs.² PROs is an umbrella term that covers a wide range of concepts. The common denominator is that PRO data refers to patients' self-reports.

Examples of PROs are functional status (FS), health status (HS), and (health-related) quality of life ((HR)QOL). Functional status refers to patients' general physical functioning.³

Although the nomenclature of HS and (HR)QOL is distinct (Figure 1), in practice these concepts are used interchangeably.³ The lack of clarity may be due to the fact that these concepts share several common grounds, while concerning content these concepts are not equivalent. HS, HRQOL and QOL are all self-reported (i.e. subjective) and multidimensional assessing at least three domains: physical, psychological, and social. Both HS and HRQOL are bound to health, while QOL is broader than health. QOL encompasses the patient's subjective evaluations of their own well-being.³ It can be assessed with questions like: 'How satisfied are you with your ability to perform your daily living activities?'. This reflects an evaluation of performance. Moreover, QOL also captures positive aspects experienced by patients in life, such as positive feelings. HRQOL is more narrowly defined and the focus is on those QOL components that are impacted by a disease or condition, for instance 'How much are

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you troubled by problems with stiffness and pain?'. For instance, QOL and HRQOL are also 'subjective' in the sense that patients indicate how they feel about and experience their ability to function. HS assesses physical possibilities, state of mind and social activities without an evaluation or feelings about functioning.³ An example question is: 'Are you able to climb the stairs?'. Thus, HS indicates whether the patient experiences any limitations. Although the patient reports his/her own limitations, it still is an objective measure of functioning. As a result, two persons may have the same score on a HS instrument, but can have different scores on a (HR)QOL questionnaire.³ For example, an older patient who is still physically active will have a lower QOL, when she has a tendon injury, than an older patient who likes to read. Figure 1 shows the relationship between QOL and related concepts.

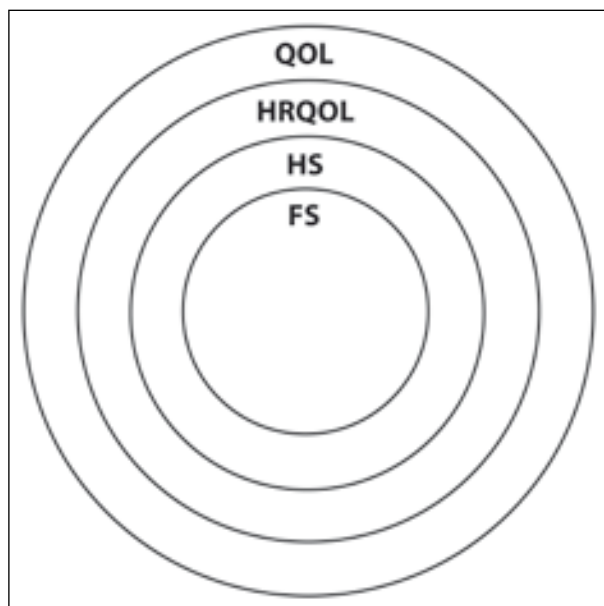


Figure 1. Conceptualisation of functional status (FS), health status (HS), health-related quality of life (HRQOL), and quality of life (QOL).

PROMs

Besides FS, HS, and (HR)QOL, PROMs can also assess symptoms, general health perceptions, or satisfaction with treatment.^{3,4} For example, the term PROMs covers a wide range of potential types of measurements. Assessing PROs with PROMs have a number of potential benefits.⁵ They may facilitate the detection of issues that might otherwise be overlooked⁵, for instance, depressive symptoms which are related to lower adherence of the treatment.⁶ PROMs can also be used to monitor the effects of disease progression and to provide information about the (potential) impact of prescribed

treatment.⁵ PROMs used in routine clinical care may facilitate patient-clinician communication about expectations regarding the outcomes of illness and/or treatment and promote shared decision making when the professional gives patients feedback on their scores on the completed PROM(s).⁵ In this way, patients feel taken seriously and will probably experience the consultation as more valuable. As such, the assessment of PROs may improve patient satisfaction apart from the fact that paying attention to the patient just by letting him/her complete a PROM also increases patient satisfaction.⁷ PROMs may also be used to monitor outcomes as a strategy for quality improvement or even predict the outcomes of care.^{4,6} Critical notes can also be found in the literature.⁸ PROMs were originally developed for use in research and subsequently adopted to support clinical management.⁹ However, in order to safely use the data it is necessary to have sufficient knowledge about how to interpret and report the data, to know how these data can be used in clinical practice, and when not to use PROMs.¹⁰

PROMs can be divided into generic, disease-specific, or condition-specific measures.³ Generic measures can be used to assess outcomes in healthy persons as well as patients with any disease or condition, while disease-specific measures describe the severity, symptoms, or functional limitations related to a specific disease. Examples of generic measures are the Eu-roQOL- 5 dimensions (EQ-5-D)¹¹ and the Short Form Health Survey (SF-36)¹². Examples of disease-specific measures are the European Organization on Research and Treatment of Cancer-Quality of Life Questionnaire-Core30 (EORTC-QLQ-C30)¹³ and the Sarcoidosis Health Questionnaire (SHQ).¹⁴ Condition-specific measures describe symptoms or experiences related to a specific condition or problem (e.g., low back pain), or are related to particular treatments, such as hip replacement. An example of a condition-specific measure is the Knee Numeric-Entity Evaluation Score (Knees-ACL), which assesses impairment, functional limitations, and psychosocial consequences of persons who have undergone an anterior cruciate ligament reconstruction.¹⁴ Other condition-specific measures are the Hip disability and Osteoarthritis Outcome Score Physical Function (HOOS hip outcome)¹⁶ and the HOOS-PS which is the short version of the HOOS and the Knee disability and Osteoarthritis Outcome Score.¹⁷

A PROM that measures a single construct is uni-dimensional. Items in a uni-dimensional questionnaire can be added to provide a single scale score. A multi-dimensional PROM is used to provide a profile of scores, in which each subscale is scored and reported separately. It is sometimes possible to cre-

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ate a total score from a multidimensional measure. However, this will result in loss of information and can no longer be considered multi-dimensional because it cannot be ascertained in which domain the patient has (a) problem(s) or is troubled or satisfied.

PROMS within the field of orthopedics

A commonly used generic instrument is the SF-36. However, although many researchers claim that they have assessed (HS)QOL, this instrument is assessing HS.^{3,18}

The EQ-5D and the HOOS have been chosen as standard PROM by the Dutch Orthopedic Society.¹ Since pain reduction was also considered to be an important outcome, visual analogue scales have been added. It is a 0 to 10(0) scale for recording an individual's rating of their pain (or health state) and is often similar to a thermometer.¹ It should be noted that the EQ-5D and the HOOS hip outcome are not QOL measures, but a HS and a FS measure according to the abovementioned definitions. When interested in QOL another measure should be chosen. Besides HS, the EQ-5D can be used to measure health utilities (also health state) and are used to calculate quality-adjusted life years (QALY). A QALY served as a composite indicator allows quality and quantity of life to be combined in a single index. Utilities are generally expressed on a numerical scale ranging from '0' (death) to '1' (perfect health). It assumes that a year of life lived in perfect health is worth 1 QALY and that a life lived in a state of less than perfect health is worth less than 1.¹⁹ This type of assessment can be used to determine the cost-effectiveness of interventions. If one is interested to assess (HR)QOL, only generic instruments are currently available. That is, the Short Musculoskeletal Function Assessment (SMFA)²⁰ which assesses HRQOL or the World Health Organization Quality of Life instrument (WHOQOL-100)²¹ which assesses QOL. The WHOQOL-100 contains 100 items which hampers its practicality in clinical practice, however a short-form is also available (i.e., WHOQOL-BREF).²² Recently, two systematic reviews provided an overview about the concepts of HS, HRQOL, and QOL and the instruments used within the field of distal radius and ankle fracture.^{23,24}

Selection of PROs and PROMs

The type of PROM should closely correspond to the PRO to be measured. In other words, the research aim will be answered adequately when a suitable PROM is chosen. Suppose we aim to assess QOL, many PROMs will be available. We have already

shown that authors use concepts interchangeably and that PROMs are supposed to measure QOL, but will not assess it per se. It is important to inspect the items of an instrument, since a QOL instrument may assess what patients can actually perform (FS or HS) or may assess to what extent a patient is satisfied or troubled by its physical performance ((HR)QOL). When a research aim is adapted, the PROM will probably also change.

Another aspect to evaluate a PROM is the way it is developed. For instance, were items derived from the appropriate source/population? Clinical input is required for the assessment of symptoms and functioning, however, when assessing QOL it is important that during the development, patients are involved in the determination of the content of the questionnaire. In addition, the questionnaire content should be clear and unambiguous and written in a reading age that most persons will be able to understand. Questionnaires containing double-barreled items damage item clarity and should be avoided. Moreover, questionnaires should be practical in (clinical) practice. For instance, the length of the measures in terms of number of the items is often considered an important selection criterion for a PROM. However, it is usually the professionals who think that patients are only prepared to answer a few questions, whereas patients feel that the clinician is really interested in him/her, especially when the score of a patient is brought up in the consultation.

It is essential that a PROM meets certain criteria concerning development, as well as psychometric and scaling standards, in order to be able to provide useful information. PROMs should have a sound theoretical basis and should be relevant to the target population. Moreover, PROMs should also be reliable, valid, and responsive to change. If a PROM is not psychometrically sound, its scores will not be interpretable, since these scores are meaningless. Reliability is defined as the degree to which scores for patients who have not changed, are the same for repeated measurement under several conditions, that is using different sets of items from the same multi-item PROMs (internal consistency); over time (test-retest reliability), and on different occasions (intrarater).²⁵⁻²⁷ Other frequently used terminology for reliability are: reproducibility, stability, and agreement. Validity is defined as 'the degree to which an instrument truly measures the construction(s) it purports to measure'.²⁵⁻²⁷ To evaluate the effects of treatment or other longitudinal changes in, for example QOL, we need PROMs that are sensitive to change. When minimal important change (MID) is applied to PROMs it refers to the smallest score change which patients perceive as important.²⁵

Another aspect is whether the results should be compared with a norm population or another patient group.²⁵⁻²⁷ This will determine whether a generic, disease-specific, or condition specific instrument should be chosen. The presence of reference population(s) for PROMS will facilitate the interpretation of patients' scores. An instrument assessing QOL developed in one country is not necessarily an adequate measure in another. This may be due to translation differences or differences in cultural issues. For instance, during the development of the WHOQOL-100 in the 1990s, traffic safety was an important aspect of QOL according to the Israeli, however in other countries this issue was not relevant. Another aspect in which cultures differed was whether a sexual problem belonged to the physical health domain or should be seen as an aspect of social relationships. Thus, the perception of QOL and the way persons deal and express health problems differs between cultures. As a consequence, if the transposition of a measure of its original cultural context is done by simple translation it is unlikely that it will be a good measure, because of language and cultural differences.^{25,26}

Conclusion

PROMs should assess the PRO one intends to measure, be well-developed, culturally adapted if necessary, be practical in use, and have good psychometric qualities, i.e. be reliable, valid, responsive to change, and the minimal important difference should be known. The EQ-5D, the HOOS and a VAS pain score have been chosen as standard PROMs by the Dutch Orthopedic Society. However, these PROMs cannot be used to assess (HR)QOL. When interested in (HR)QOL another measure should be chosen. Currently, only generic instruments are currently available in the field of orthopedics. The SMFA can be used to assess HRQOL, while the WHOQOL-BREF or WHOQOL-100 can be used to assess QOL.

Abstract

Patient Reported Outcome Measures (PROMs) refer to a variety of measures that are used to assess patient-reported outcomes (PROs). PROMs are often selected because they are commonly used or are available in a wide range of languages. Although important, such factors are not the only factors to consider. PROMs should assess the PRO one intends to measure, such as health status, health-related quality of life (HRQOL) or quality of life (QOL), it should be well-developed, and have good psychometric qualities, i.e. be reliable, valid, responsive to change, and the minimal important difference

should be known. In addition, one should examine the practicality of the measure and/or cross-cultural validity. The EuroQOL-5 dimensions (EQ-5D), the Hip disability and Osteoarthritis Outcome Score Physical Function (HOOS) and a visual analogue scale (VAS) pain score have been chosen as standard PROMs by the Dutch Orthopedic Society. However, it should be noted that these PROMs cannot be used to assess (HR)QOL. When interested in (HR)QOL another measure should be chosen. However, within the field of orthopedics only generic instruments are currently available. The Short Musculoskeletal Function Assessment (SMFA) can be used to assess HRQOL or the World Health Organization Quality of Life instrument-100 items (WHOQOL-100) and its short version (WHOQOL-BREF) can be used to assess QOL.

References

1. Nederlandse Orthopaedische Vereniging (NOV). Patient reported outcomes, 2012.
2. Patrick D, Guyatt GH, Acquadro C. Chapter 17: Patient-reported outcomes. In: Higgins JPT, Green S (editors), Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 (updated March 2011). The Cochrane Collaboration, 2011. Available from www.cochrane-handbook.org.
3. De Vries, J., Quality of life assessment, in Assessment in behavioral medicine, A.J.J.M. Vingerhoets, Editor 2001, Brunner-Routledge: Hove. p. 353-370.
4. Rothman ML, Beltran P, Cappelleri JC, Lipscomb J, Teschendorf B, Mayo/FDA Patient-reported Outcomes Consensus Meeting Group. Patient-reported outcomes: conceptual issues. *Value Health*. 2007; 10: S66-75.
5. Valderas JM, Kotzeva A, Espallargues M, Guyatt G, Ferrans CE, Halyard MY, Revic-ki DA, Symonds T, Parada A, Alonso J. The impact of measuring patient-reported outcomes in clinical practice: a systematic review of the literature. *Qual Life Res*. 2008; 17: 179-93.
6. Sundbom LT, Bingefors K. The influence of symptoms of anxiety and depression on medication nonadherence and its causes: a population based survey of prescription drug users in Sweden. *Patient Preference Adherence* 2013; 19:805-11.
7. Chen J, Ou L, Hollis SJ. A systematic review of the impact of routine collection of patient reported outcome measures on patients, providers and health organisation in an oncologic setting. *BMC Health Serv Res* 2013, 11; 13: 211.
8. Wolpert M. Do patient reported outcome measures do more harm than good? *BMJ*. 2013; 346: f2669.
9. Black N. Patient reported outcome measures could help transform healthcare. *BMJ* 2013; 346: 167.
10. Glasziou P, Irwig L, Aronson JK. Evidence-based medical monitoring: from principles to practice. Blackwell, 2008
11. EuroQol - a new facility for the measurement of health-related quality of life. The EuroQol Group. *Health Policy* 1990; 16: 199-208.
12. Ware Jr JE, Sherbourne CD. The MOS 36-item short form

health survey (SF-36). I. Conceptual framework and item selection. *Med Care* 1992; 30: 473-83.

13. Aaronson NK, Ahmedzai S, Bergman B, et al. The European Organization for Research and Treatment of Cancer QLQ-C30: a quality-of-life instrument for use in international clinical trials in oncology. *J Natl Cancer Inst* 1993; 85: 365-376.
14. Cox CE, Donohue JF, Brown CD, Kataria YP, Judson MA. The Sarcoidosis Health Questionnaire: a new measure of health-related quality of life. *Am J Respir Crit Care Med*. 2003, 168: 323-9.
15. Comins J, Krogsgaard M, Brodersen J. Development of the knee numeric-entity evaluation score (KNEES-ACL): a condition specific questionnaire. *Scand J Med Sci Sports* 2013; 23: 293-301.
16. de Groot IB, Reijman M, Terwee CB, Bierma-Zeinstra SM, Favejee M, Roos EM, Verhaar JA. Validation of the Dutch version of the Hip disability and Osteoarthritis Outcome Score. *Osteoarthr Cartil*. 2007; 15: 104-109.
17. Roos EM, Lohmander LS. Knee injury and Osteoarthritis Outcome Score (KOOS): from joint injury to osteoarthritis. *Health Qual Life Outcomes* 2003; 1:64.
18. Hamming JP, De Vries J. Measuring quality of life. *Br J Surg* 2007; 94:923-924.
19. Prieto L, Sacristán JA. Problems and solutions in calculating quality-adjusted life years (QALYs). *Health Qual Life Outcomes*. 2003; 19: 1-80.
20. Swiontkowski MF, Engelberg R, Martin, DP., Agel, J. Short musculoskeletal function assessment questionnaire: validity, reliability, and responsiveness. *J Bone Joint Surg Am* 1999; 81: 1245-1260.
21. WHOQOL Group. Development of the WHOQOL: rationale and current status. *Int J Ment Health* 1994; 23: 24-56.
22. WHOQOL Group. Development of the World Health Organization WHOQOL-BREF quality of life assessment. *Psychol Med* 1998; 28: 551-558.
23. Van Son MA, De Vries J, Roukema JA, Den Oudsten BL. Health status and (health-related quality of life during the recovery of distal radius fractures: a systematic review. *Qual Life Res* 2013 Mar 22.
24. Van Son MA, De Vries J, Roukema JA, Den Oudsten BL. Health status, health-related quality of life, and quality of life following ankle fractures: a systematic review. *Injury. Int. J. Care Injured* 2013; 44: 1391-1402.
25. Mokkink LB, Terwee CB, Patrick DL, et al. The COSMIN study reached international consensus on taxonomy, terminology, and definitions of measurement properties for health-related patient-reported outcomes: results of the COSMIN-study. *J Clin Epi-demiol* 2010; 63: 737-45.
26. Mokkink LB, Terwee CB, Patrick DL, et al. The COSMIN checklist for assessing the methodological quality of studies on measurement properties of health status measurement instruments: an international Delphi study. *Qual Life Res* 2010; 19: 539-549.
27. Terwee CB, Bot DM, de Boer MR, van der Windt DAWM, Knol DL, Dekker J, Bouter, LM, de Vet HCW. Quality criteria were proposed for measurement properties of health status questionnaires. *J Clin Epidemiol* 2007; 60: 34-42.

Quality in Motion - a critical assessment of surgical treatment of adolescent idiopathic scoliosis

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Introduction

The assessment of performance and quality in health care and in orthopaedics has become more important in the last decades. The Dutch Orthopaedic Society (NOV) has recently published its quality plan 2012-2014 "Kwaliteit in beweging" (Quality in Motion) in which the value of quality assessment is explicitly described: "orthopedisch chirurgen werken aan het inzichtelijk maken van de eigen prestaties om de kwaliteit van de orthopedische zorg te verbeteren". The orthopaedic department of the Sint Maartenskliniek (SMK) Nijmegen endorses the importance of internal quality assessment of treatments to continually improve performance, and has implemented this internally under the "MaartensFacts" program. With the "Plan-Do-Check-Act" concept (PDCA-cycle) different stages of our treatment protocols can be assessed. This cycle has never been described before in quality assessment of spine surgery. In the preparatory phase (Plan) a protocol is designed and subsequently the treatment can be performed (Do) according to this protocol. Then the results can be critically examined and compared to the protocol by an internal quality assessment (Check); did we perform according to our protocol? Are our treatment results as we expected? Finally, issues to improve the performance are defined (Act), which also need to be verified in the future.

As a result, in 2012 a quality assessment of our surgery in adolescent idiopathic scoliosis (AIS) was performed, analysing, for example, how many pa-

tients have no surgical or neurological complications, is the planned length of stay realistic, and what is the number of postoperative wound infections. Many literature reports on radiographic correction exist as an objective appraisal of outcome in surgery in AIS^{1,2,3}, but the correlation between these radiological findings and the functional outcome after surgical correction of a scoliosis are weak.^{1,8} However, the actual peri-operative clinical course after surgery and quality of life are not often reported and local assessment is necessary as reports from the literature may not always be applicable to the individual health care provider.

As part of the PDCA-cycle the goal of this study was to perform the "Check" with the aim of improving our treatments. Therefore, we assessed the intra- and postoperative data of posterior instrumented fusion, in the treatment of AIS, that we provide for our patients. Results of this study allows us to improve the bottlenecks in our protocol. Besides this it enables us to provide up to date and actual information for patients and stakeholders such as payers and regulators.

For this purpose we studied our consecutive cohort of all adolescent and young adult patients with AIS surgically treated in 2011 with 100% 3-monthly follow-up.

Methods

Data collection

In this study all 80 patients with adolescent idiopathic scoliosis, age 12-25 years, treated by posterior instrumented fusion in 2011 in the Sint Maartenskliniek Nijmegen were evaluated as part of an internal quality assessment programme (MaartensFacts). Data were obtained from a retrospective chart review. Preoperative data were demographic items such as age, sex, BMI, curve type and severity.

Peri-operative information such as the number of instrumented levels, operative time, estimated blood loss and complications was collected.

The postoperative period in this study was separated into the clinical and outpatient clinic phase. Clinical data collected included length of stay, complications, pain scores (in the Post-Anaesthetic Care

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Unit (PACU) and at discharge). During the outpatient clinic visit, 3 months after discharge, both pain score and occurrence of complications were collected. Supplemental treatment, if necessary, was registered. All data were obtained from both paper records and the electronic patient records system. Complications were registered in two ways: in a complication database, which we meticulously keep up to date, and in the patient files.

Procedure

The single posterior instrumented fusion was performed by three orthopaedic surgeons specializing in treatment of spinal deformities.

All patients were preoperatively treated for five days with nasal mupirocin to reduce potential nasopharyngeal carriage of staphylococcus. Furthermore, 15-60 minutes before incision 1000 mg ceftazolin intravenous prophylaxis was administered. This dose was repeated every 8 hours for 24 hours after surgery.

In all procedures intra-operative neurophysiologic spinal cord monitoring with trans cranial motor evoked potentials (TcMEP) was used. Neurophysiologic signals were analysed to establish in which situation changes occurred caused by surgical, anaesthetic or combined reasons.

Hybrid instrumentation (ExpEDIUM/favored angle screws® Depuy-Synthes Spine, Johnson&Johnson and Universal Spine System (USS)®, Depuy-Synthes Spine) was used in all patients to create segmental fixation predominantly with pedicle screws and a limited number of hooks at the top end of the construction (total implant density 60-80% where 100% means 2 fixation points per vertebra). Inferior facetectomy was performed as a standard procedure and in rigid curves, also Ponte osteotomies were performed, to improve curve flexibility. Local bone graft was used, mixed with 10 cc of beta tricalcium phosphate granules (ChronOs®, DePuy-Synthes Spine). No iliac crest bone graft or donor allograft bone was used.

Blood management

Before incision a bolus of tranexamic acid (10 mg/kg) i.v. was given and if necessary this was repeated after 3 hours. The procedure was performed under relative hypotension (Mean Arterial Pressure 60-70 mmHg). Blood salvage (Cell Saver®) was used to collect, filter and re-infuse lost blood. Post-operatively a re-infusion drain (Bellovac®) was used for 24-48 hours.

Wounds were dressed with a sealing (Aquacell®), which was left on the wound until the fourth post-operative day.

Pain management

An epidural catheter was routinely placed through a flavectomy in the surgical site by the surgeon at the end of the surgical procedure, in order to provide sufficient analgesia in the early postoperative period. Ropivacaine 0.2% combined with sufentanil 0.5-1 µg/ml was administered for 72 hours and patients were able to mobilise with this so-called "walking epidural". Supplemental analgesia was given with acetaminophen and Non Steroidal Anti Inflammatory Drugs (NSAIDs) according to a standard protocol. After removal of the epidural catheter escape opiates were prescribed. Pain was evaluated at regular intervals using a 10-point numeric rating scale (NRS).

A urinary catheter was used for 72 hrs (as long as the epidural catheter was in place).

Postoperative regime

Postoperative mobilisation was performed in the presence of a physiotherapist. On post-operative day 1 (POD1) patients sat on the rim of their bed and also stood alongside their bed. On the second postoperative day (POD2), patients walked with their epidural and on POD3 they walked and the epidural was removed. On POD4 patients were on oral pain medication, climbed stairs and if possible patients were discharged on POD 4 or 5. Before discharge full spine posterior-anterior and lateral standing X-rays were taken.

No supporting thoraco-lumbar external orthosis or brace was used during postoperative mobilisation.

Statistical analysis

Patient characteristics and outcome measures were presented as means and standard deviations or median and range. Furthermore, Pearson and Spearman correlation coefficients were used to establish correlations between blood loss and patient or surgery characteristics. The level of significance was set at $p < 0.05$. Data-analysis was performed using the statistical package of STATA 10.0.

Results

The study population consisted of 72.5% females, with a mean age of 16 years (± 3.1) and a mean Body Mass Index (BMI) of 20.5 kg/m² (± 3.5), 93.5% of the curves were right sided and the mean number of surgical treated levels were 10 (± 1.7). Mean duration of the procedure, including anaesthetic and neurophysiologic monitoring preparation, was 265 minutes (± 35.5). The median intra-operative blood loss was 1000 mL (range 360-6100 mL). Blood loss was highly variable, with a relatively high number of patients (22 of 80) with blood loss of more than 1500 mL, of whom 11

with >2000 mL. However an extensive analysis demonstrated no evident correlation between the amount of blood loss and number of treated levels ($r=0.24$), surgery time ($r=0.40$), weight ($r=-0.17$), or BMI ($r=-0.18$). Three patients (4%) required an allogenic blood transfusion.

The numeric rating scale (NRS) for pain showed a median score of 3 (range 1-8) direct postoperative, which subsequently decreased to 2 (range 0-5) just before discharge.

Median length of stay was 5.9 days (range 5-15), including the day of surgery. Our protocol describes discharge at postoperative day 5 and in this study 68 of 80 patients (85%) achieved this goal. In none of them was a complication observed. In twelve patients with a complication in the clinical period, a prolonged stay was observed with a maximum of 15 days.

Complications

All adverse events (deviation from protocol) and complications are listed in Table 1-3.

In 5% of our patients a re-operation was performed.

There were no postoperative wound infections (POWI). All patients with a complicated course healed uneventfully.

Spinal cord monitoring

In 30 patients (37.5%) a decrease in amplitude was observed during surgery. In 11 patients this was due to the surgical procedure (e.g. during the correction procedure), in 13 patients due to anaesthetic or positioning problems (e.g. decrease of blood pressure) and in 6 patients a combination of both above-mentioned reasons was identified.

In two cases the reduced responses required reducing the already acquired curve correction by the surgeon to obtain a normal neurophysiologic signal again. No postoperative neurologic deficits occurred.

Discussion

In this study we evaluated the outcomes of posterior surgery in AIS in the perioperative phase and up to 3 months post-surgery as part of an internal

Table 1. Intra-operative complications in 80 patients treated by posterior instrumented fusion for AIS.

Intra-operative complications	Number of patients	Treatment	Outcome
Blood loss	Median 1000 mL (360-6100)	Autologous transfusion	Uneventful
Blood loss >2000 mL	11 patients (13.8%)	Donor transfusion in 3 patients (after autologous transfusion)	Uneventful
Dural lesion	1 patient	Tissuecol, bed rest 24 hours, 72 hours prolonged antibiotics	Uneventful
Pneumothorax due to anterior perforation pedicle screw	1 patient	Chest tube for 3 days	Uneventful

Table 2. Postoperative complications in 80 patients treated by posterior instrumented fusion for AIS during hospital stay.

Postoperative complications	Number of patients	Treatment	Outcome
Malposition pedicle screw	2 patients	Re-operation with screw replacement	Uneventful
Loss of wound drain	1 patient	Observation	Uneventful
Persistent wound drainage at discharge	1 patient	Examination at outpatient clinic 5 days after discharge	Uneventful
Ventilatory depression due to opiates	1 patient	Observation at the Postoperative Anaesthetic Care Unit	Uneventful

Table 3. Late post-operative complications in 80 patients treated by posterior instrumented fusion for AIS.

Complications after discharge from hospital	Number of patients	Treatment	Outcome
Malposition screw/rod	5 patients	Re-operation in 2 patients for screw or rod replacement	Uneventful
Persistent pain (VAS 2-3)	3 patients	2 patients treated with oral pain medication. 1 patient was treated with an intercostal block	Still not definitely known
Persistent sagittal dysbalance	2 patients	Physiotherapy	Still not definitely known

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quality control program (MaartensFacts) as part of the “Check” in the PDCA-cyclus. Variable complication rates are reported in the literature regarding this procedure; malposition of pedicle screw up to 10.4%, post-operative wound infection rates of 4% and dural lesions even up to 12%.^{5,6,7} The complication rate observed in this study was smaller than reported in literature, there were no post-operative wound infections or dural lesions. Furthermore, 85% of the patients were discharged according to our protocol by post-operative day 5. Consequently posterior correction of AIS with pedicle screw-hook constructions in our clinic in 2011, was a relatively safe procedure. Nevertheless, the relatively high peri-operative blood loss and the 5% re-operation rate due to malposition of implants were higher than we had expected, and making this clear to the surgical team illustrates the value of quality control. These items were then addressed by the team and used “to Act” and improve our treatment protocol. Eventually no patients had lasting negative effects from the adverse events. All patients with a complicated course healed uneventfully.

Complications

When looking in detail into the type and number of complications we are concerned about two items; first the blood loss. In this study 27.5% of our patients had a blood loss of 1500 mL or more. However, no evident correlation with number of treated levels, surgeon or BMI was found. A recent published study by Ialenti et al.⁴ described an estimated blood loss of 907 mL (± 775) in 188 cases of posterior spinal fusion in AIS. This is comparable to our results, however we have to focus on the outliers; we had 11 cases of more than 2000 mL. Based upon these high levels of blood loss we invited one of our anaesthesiologists to participate in this study to obtain a total view in our strategy to improve our protocol. As a result of this we found

that the dosage of tranexamic acid used in 2011 was relatively conservative. Therefore, based on this study the protocol has been altered to an increased dose of 1 gram at induction followed by 1 gram administered in 8 hours via continuous intra venous infusion. Although a full dataset is not yet available, the mean blood loss in the second quarter of 2013 has reduced from 1000ml to 883 mL, and especially the percentage of patients with blood loss equal or greater than 1500ml has been reduced from 27.5% to 11.8% (2/17). We also believe that surgeon and anaesthesiologist awareness may have helped decrease blood loss, by subtly altering surgical exposure and meticulous attention to haemostasis. However this cannot be proved.

The second point of interest is the malposition of implants. A total of more than 1000 screws and hooks were placed. During hospital stay 2 patients were reoperated due to malposition of a pedicle screw. In both cases a pedicle screw was successfully replaced. Furthermore, in the first 3 months postoperatively, 5 patients developed a malposition of a pedicle screw or rod, and out of the 5 two needed a reoperation. In the first patient, a pull through of pedicle screw at L3 level was treated by extension of the fusion to L4 and, in the second patient, a loosening of the locking cap at level Th12 was seen on the X-ray, which was revised. All patients healed uneventful.

A clear explanation for malposition of implants is difficult to provide, since in all patients there was a pre-operative planning for the implant positioning. Surgery was performed using fluoroscopy to check the position of a pedicle screw in two directions. This will be continued. Nevertheless, we have to be aware of this complication during our future surgery and discuss possible improvements in planning and performing our surgeries. An important aspect is weekly spine team meetings to discuss cases and results. Also, as a result of this

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study, the cooperation between spine surgeons and anaesthesiologists has been improved, and meetings will be scheduled with our anaesthesiologists to discuss extraordinary or complicated cases.

Spinal cord monitoring

No postoperative neurologic deficit occurred, but in two patients with a substantial decrease of amplitude during curve correction, rapid reduction of the correction may have prevented neural injury. Spinal cord monitoring in our setting has proved to be invaluable. We believe that with current pedicle screw based correction systems, very large corrections can be achieved, but that at the same time the limits of what the spinal cord can accommodate may be reached. Therefore, we will continue to use monitoring of motor evoked potentials in all our spine deformity cases.

Pain management

The use of the current protocol, including the use of a "walking" epidural, gives adequate pain control as shown by NRS pain scores of 3 reducing to 2 at discharge. The current protocol does not need to be changed, but we will aim to improve pain management further.

Since this study was performed retrospectively, we did not report PROMs in this cohort. As a part of the Maartensfacts project, AIS patients will be prospectively asked to fill out pre- and postoperatively PROMs (i.e. SRS-22 questionnaire) in the Dutch Spine Surgery Registry in the very near future.

Length of Stay (LOS)

85% of our patients managed to be discharged home in accordance with the clinical pathway of Post Operative Day 5, with a median pain NRS score of 2, which suggests that the pathway is realistic and achievable.

We are looking at speeding up recovery, and aim to shorten Length of Stay further to 4 days post-operative. For this, it is important to have an excellent pain management and rehabilitation protocol. Our physiotherapists and anaesthesiologists have been closely involved to achieve this goal.

With this data we will also be able to inform both our future patients and payers and regulators of our outcomes.

This same patient cohort will be followed long term in order to evaluate Quality of Life and radiological outcomes over the next years. We strongly believe that continuous efforts at improving our health care delivery by systematically implementing the Plan-Do-Check-Act cycle is essential for all health care providers. Monitoring quality of care such as

this project forms the vital "check" step, which is often overlooked in health care.

Conclusion

Posterior instrumented fusion and correction of adolescent idiopathic scoliosis with pedicle screw-hook constructions with high implant density, is a safe procedure in our clinic. In this 2011 cohort there were relatively low complication rates, no neurologic injuries, no wound infections and relatively low re-operation rates (4/80). All adverse events in this cohort of patients healed without permanent disability. Based on this study we have altered our blood management protocol, resulting in lower blood loss in 2013. 85% of patients managed to be treated according to our clinical pathway. This study protocol with implementation of the PDCA cycle may also be important for other orthopaedic surgical treatments and could be used as a future tool for the NOV or Dutch Spine Society (DSS) to check quality of treatment.

This cohort of patients will be followed during the coming years to study long term outcome. Standard full spine posterior-anterior and lateral standing radiographs will be made and PROM questionnaires will be used.

Abstract

BACKGROUND: Adolescent idiopathic scoliosis (AIS) can be treated with posterior correction, instrumentation and fusion. To investigate the peri-operative safety, and the occurrence of adverse events in posterior pedicle screw instrumentation, of patients routinely treated at our institute for AIS, a quality assessment study was performed. In this way we can inform our patients, pre-operatively, and health care providers to the best of our knowledge. Besides this we can establish if improvements in our treatment can be made.

METHODS: All 80 consecutive patients who underwent primary posterior instrumented fusion surgery for AIS, at the Sint Maartenskliniek in 2011, were reviewed. Data was collected pre-operatively, during surgery and hospital stay and 3 months post-operatively. All patients were operated using a hybrid screw-hook system with a high implant density (60-80%) and with spinal cord monitoring using motor evoked potentials (TcMEP).

RESULTS: In total, 80 patients, average 16 (± 3.1) years and 72.5% female, underwent surgery. In 37.5% of the cases a decrease in TcMEP amplitude was observed, twice requiring further intra-operative corrective actions, but without any post-operative neurologic deficit. Median blood

loss was 1000 mL (range 360-6100 mL), 22 cases showed >1500 mL blood loss during surgery, but due to blood conservation management only three required a blood transfusion. During hospital stay, 2 patients required re-operation due to implant malpositioning. The median NRS pain score on discharge from hospital was 2 (range 0-5). The median length of stay was 5.9 (range 5-15) days. 85% of patients were discharged in accordance with the clinical pathway on POD 5. In total six patients had complications during hospital stay. Three months postoperatively 8 complications were observed: screw or rod malposition (n=5, of whom 2 were re-operated), persistent pain (n=3). No signs of infection were reported.

CONCLUSION: Posterior instrumented fusion and correction of adolescent idiopathic scoliosis with pedicle screw-hook constructions with high implant density is a safe procedure in our clinic. In this 2011 cohort there were relatively low complication rates, no neural injuries, no wound infections and relatively low re-operation rates (4/80). All adverse events in this cohort of patients healed without permanent disability. Based on this study we have altered our blood management protocol, resulting in lower blood loss in 2013. 85% of patients managed to be treated according to our clinical pathway. This cohort of patients will be followed during the coming years to study long term outcome.

Disclosure statement

This study was performed with internal hospital funding. There were no conflicts of interests to report.

References

1. D'Andrea LP, Betz RR, Lenke LG, Clements DH, Lowe TG, Merola A, et al. Do radiographic parameters correlate with clinical outcomes in adolescent idiopathic scoliosis? *Spine (Phila Pa 1976)*; 2000;25:1795-02
2. Asher M, Min Lai S, Burton D, Manna B. The reliability and concurrent validity of the scoliosis research society-22 patient questionnaire for idiopathic scoliosis. *Spine (Phila Pa 1976)*; 2003;28:63-69
3. Bas T, Franco N, Bas P, Bas JL. Pain and disability following fusion for idiopathic adolescent scoliosis; prevalence and associated factors. *Evid Based Spine Care J* 2012;3:17-24
4. Ialenti MN, Lonner BS, Verma K, Dean L, Valdevit A, Errico T. Predicting operative blood loss during spinal fusion for adolescent idiopathic scoliosis. *J. Pediatr. Orthop.* 2013;33(4):372-6
5. Li G, Lv G, Passias P, Kozanek M, Methar US, Liu Z, et al. Complications associated with thoracic pedicle screws in spinal deformity. *Eur Spine J.* 2010;19:1576-84
6. Di Silvestre M, Parisini P, Lolli F, Bakaloudis G. Complications of thoracic pedicle screws in scoliosis treatment. *Spine (Phila Pa 1976)* 2007;32:1655-61
7. Suk SI, Kim WJ, Lee SM, Kim JH, Chung ER. Thoracic pedicle screw fixation in spinal deformities: are they really safe? *Spine (Phila Pa 1976)*. 2001;15:2049-57
8. Wilson PL, Newton PO, Wenger DR, Hafer T, Merola A, Lenke L, et al. A multicenter study analyzing the relationship of a standardized radiographic scoring system of adolescent idiopathic scoliosis and the Scoliosis Research Society outcomes instrument. *Spine (Phila Pa 1976)*; 2002;27:2036-40

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A painful swelling above the clavicle caused by a musculus levator claviculae

www.ntv-orthopaedie.nl/kuiper2102/

Jesse W.P. Kuiper, Jorm M. Nellensteijn and Bart J. Burger

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A supraclavicular swelling can have many causes.¹ A case of a rare, benign swelling above the clavicle is presented.

Patient

A 27 year old female attended the orthopaedic outpatient clinic with a swelling above the right clavicle. She had first noticed this swelling a few months earlier, because of pain near the clavicle. She had no pain in the glenohumeral and cervical region. No prior trauma was mentioned, nor did the swelling increase over time. The patient worked in a store, where she had to perform a lot of lifting activities. She had no previous illnesses or co-morbidities, and did not participate in any sport activities.

Physical examination of the right shoulder was painless and showed a full range of motion. No abnormalities were seen or palpated around the glenohumeral and acromioclavicular joint. Resistance tests showed symmetric strength without pain. Examination of the neck showed a full range of motion. Pain could not be provoked by movement or palpation. Cranial to the right clavicle, in the posterior cervical triangle, an oblong swelling was seen, extending between the diaphysis of the clavicle and the cranial portion of the trapezius descendens muscle. The swelling was more visible during contraction of this part of the trapezius muscle. The subcutaneous, smooth swelling was estimated to be approximately 3 cm wide and 7 cm long, was not fixed to the skin but attached to the deeper layer, did not have an abnormal temperature or colour, was elastic in consistency and showed no pulsations. The point of attachment on the middle third of the clavicle was painful on palpation. No comparable swelling was observed on the contralateral side (Figures 1 and 2).

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Figure 1. Frontal view of the shoulders, with the outline of the levator claviculae muscle above the right clavicle. 



Figure 2. Lateral view of the right shoulder. The outline of the levator claviculae muscle can be seen between the trapezius muscle and the diaphysis of the clavicle. 

Diagnostic dilemma

A swelling in the neck is a common finding and it is often difficult to judge the nature of the tumour at once.¹ A supraclavicular swelling may be a congenital abnormality, inflammation, benign neoplasm or either a primary or secondary malignancy.¹

Additionally, X-rays and ultrasound of the shoulder were performed. No osseous abnormalities were seen on the X-rays. Using ultrasound, a homogeneous swelling with a muscular structure was seen on the right side, which was undetectable on the left side. Because of the possible progressive nature of the swelling, a MRI scan was performed. The MRI showed muscle tissue, originating from the transverse process of the fourth cervical vertebra and inserting on the diaphysis of the clavicle (Figures 3 and 4). This accessory muscle is known as 'a musculus levator claviculae'.²

Comparison

The levator claviculae muscle is a rare variant of normal anatomy that can be found in the posterior neck triangle. This accessory muscle is also described as 'musculus cleidocervicalis', 'musculus omocervicalis' and 'musculus trachelo-acromialis'. This variation is based on different origins and insertions.³ A PubMed search using keywords "levator AND claviculae" produced 16 references.³⁻¹⁸ Using the terms "cleidocervical*", "omocervical*" and "trachelo-acromial*", two additional articles were found.^{19,20}

Outcome

Only two publications, both case-reports, describe a patient with a painful levator claviculae muscle.^{4,5} Ginsberg et al. described a 37 year old woman with a levator claviculae muscle complaining of intermittent pain, especially when lifting. After diagnosis, no treatment was started because she had no signs of inflammation or other abnormalities.⁴ Aydog et al. described a 26 year old gymnast with thoracic outlet syndrome caused by a levator claviculae muscle. One month after adapting his training programme, the symptoms disappeared.⁵

Only one patient had symptoms comparable to those of the above-described patient, and in that particular case, given the benign nature of the swelling, no treatment was started. No mention was made as to whether the patient was satisfied.⁴ In our case, the patient was advised to use non-steroidal anti-inflammatory drugs and reduce heavy lifting during her work activities. When she returned to the

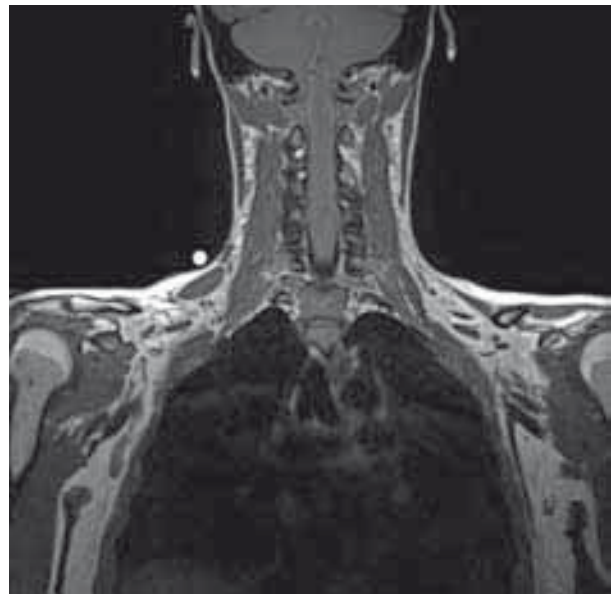



Figure 3. T1 weighted MRI, coronal view, with a marker above the accessory levator claviculae muscle. 

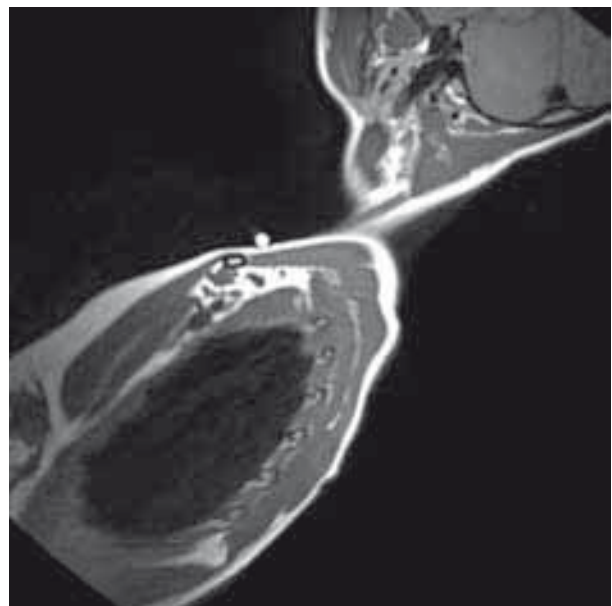



Figure 4. T1 weighted MRI, oblique view, with the levator claviculae muscle perpendicular to the clavicle shaft, clearly visible at the location of the marker. 

outpatient clinic after twelve weeks, the pain had gradually disappeared in the two months after she had followed the given advice .

Relevant literature

The levator claviculae muscle is an accessory muscle, extending from the cervical spine (origins from C1 to C6 have been described) to the clavicle.^{3,13} In most mammals, including primates, the muscle is always bilaterally present, but in humans this ves-

tigial muscle is rare: Rubinstein et al. found a prevalence of 2%, after the evaluation of 300 CT scans, but in a more recent cadaver study, with around 2,000 cadavers, the muscle was found in only 0.1% of the cadavers.^{3,15} As of yet, this absence has no phylogenetic explanation.^{3,13} Although some authors suggest that the muscle variant is more common on the left side than on the right^{7,15}, a recent review showed that the distribution is approximately equal.¹³

The oldest documentation of the existence of the levator claviculae muscle in man can be found in an anatomical drawing by Leonardo da Vinci, from the beginning of the 16th century, and in 1871, Darwin described the muscle in 'The descent of man' as: "an example of many muscles found in all kinds of apes", but being rare in humans.²¹ Only 22 cases have been described since.¹³

Most publications describe a levator claviculae muscle found in cadavers.^{3,6,7,10,11,13} In reports of clinical cases, the muscle was usually an incidental finding in imaging studies.^{4,8,16,18} Only four articles describe a patient presenting with a swelling, of which two were painless and two described a levator claviculae muscle causing pain.^{4,5,14,17}

Recommendations

When a patient presents with a painful or painless swelling above the clavicle, the presence of an accessory levator claviculae muscle should be considered. Despite the possibility for a clinical diagnosis, imaging studies are essential to rule out possible other, malignant, causes of swelling. Options for the treatment of local pain have not been described in the literature. When the insertion of the levator claviculae muscle is painful, overloading should be avoided, and non-steroidal anti-inflammatory drugs can be prescribed. When pain persists, local injections with steroids or botuline toxin might be an option, although such methods have never been described.

Disclosure

No conflict of interest.

References

1. Nederlandse Werkgroep Hoofd-Hals Tumoren. "Klier in de hals; pathologie". 2013. Ref Type: Online Source
2. Gray H. Gray's Anatomy: The Anatomical Basis of Clinical Practice. 40 ed. Philadelphia, Verenigde Staten: Churchill Livingstone, Elsevier; 2008.

3. Loukas M, Sullivan A, Tubbs RS, Shoja MM. Levator claviculae: a case report and review of the literature. *Folia Morphol (Warsz)* 2008;67(4):307-310.
4. Ginsberg LE, Eicher SA. Levator claviculae muscle presenting as a neck mass: CT imaging. *J Comput Assist Tomogr* 1999;23(4):538-539.
5. Aydog ST, Ozcakar L, Demiryurek D, Bayramoglu A, Yorubulut M. An intervening thoracic outlet syndrome in a gymnast with levator claviculae muscle. *Clin J Sport Med* 2007;17(4):323-325.
6. Barbaix E, Van RP, Janssens V, Clarijs JP. [Simultaneous observation of multiple variants of muscles of the neck and the shoulder girdle, one of which is a M. levator claviculae]. *Morphologie* 1999;83(262):13-14.
7. Capo JA, Spinner RJ. The levator claviculae muscle. *Clin Anat* 2007;20(8):968-969.
8. Fasel J, Gailloud P, Terrier F. Three-dimensional reconstruction of a levator claviculae muscle. *Surg Radiol Anat* 1994;16(3):303-305.
9. Holibkova A, Machalek L. A contribution to the anomalies of heterochtonic back muscles. *Acta Univ Palacki Olomuc Fac Med* 1998;141:53-55.
10. Leon X, Marañillo E, Quer M, Sanudo JR. Case report: cleidocervical or levator claviculae muscle. A new embryological explanation as to its origin. *J Anat* 1995;187 (Pt 2):503-504.
11. Natsis K, Apostolidis S, Nikolaidou E, Noussios G, Totlis T, Lazaridis N. Levator claviculae muscle: a case report. *Cases J* 2009;2:6712.
12. O'Sullivan ST, Kay SP. An unusual variant of the levator claviculae muscle encountered in exploration of the brachial plexus. *J Hand Surg Br* 1998;23(1):134-135.
13. Odate T, Kawai M, Iio K, Funayama S, Futamata H, Takeda S. Anatomy of the levator claviculae, with an overview and a literature survey. *Anat Sci Int* 2012;87(4):203-211.
14. Rosenheimer JL, Loewy J, Lozanoff S. Levator claviculae muscle discovered during physical examination for cervical lymphadenopathy. *Clin Anat* 2000;13(4):298-301.
15. Rubinstein D, Escott EJ, Hendrick LL. The prevalence and CT appearance of the levator claviculae muscle: a normal variant not to be mistaken for an abnormality. *AJNR Am J Neuroradiol* 1999;20(4):583-586.
16. Rudisuli T. Demonstration of a musculus levator claviculae. *Surg Radiol Anat* 1995;17(1):85-87.
17. Ruiz SF, Lopez MG, Chamorro SC, Tristan Fernandez JM. Levator claviculae muscle presenting as a hard clavicular mass: imaging study. *Eur Radiol* 2001;11(12):2561-2563.
18. Shaw AS, Connor SE. Unilateral levator claviculae muscle mimicking cervical lymph node enlargement in a patient with ameloblastoma. *Dentomaxillofac Radiol* 2004;33(3):206-207.
19. Tomo S, Toh H, Hirakawa T, Tomo I, Kobayashi S. Case report: the cleidocervical muscle with speculation as to its origin. *J Anat* 1994;184 (Pt 1):165-169.
20. Sterba O. M. omocervicalis in the horse. *Folia Morphol (Praha)* 1967;15(4):355-357.
21. Darwin C.R. The descent of man, and selection in relation to sex. London: John Murray; 1871.

Spontaneous rupture of the cruciate ligaments in a patient with hypercalcaemia from chronic renal disease - a case report and review of the literature

Chang Ho Wessel and Ton Vervest

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We describe a patient with instability symptoms of the left knee and no history of a preceding trauma. MRI revealed a complete rupture of both the anterior and the posterior cruciate ligaments. Hip and knee X-rays showed large calcifications in the peri-articular soft tissues. The patient suffered from haemodialysis dependent chronic renal disease with subsequent hypercalcaemia for years, severe osteomalacia as a consequence of aluminium intoxication, severe polyneuropathy and obesity. A knee arthroscopy revealed ruptured cruciate ligaments with calcium deposits on histological examination of biopsies. We assumed that the calcifications in the cruciate ligaments probably contributed to a spontaneous rupture of the ligaments. We searched the literature for similar cases.

Introduction

Hypercalcaemia is most commonly encountered in the internal medicine department, however it may also well be correlated to orthopaedic problems. In renal insufficiency there is a reduced production of 1,25-dihydroxyvitamine D (calcitriol) and there is impaired clearance of phosphate. Consequently, the excess of phosphate binds to the calcium leading to hypocalcaemia. In response more calcium is produced, resulting in secondary hyperparathyroidism.¹ Secondary hyperparathyroidism usually coexists with chronic renal disease.² Prolonged secondary hyperparathyroidism results in tertiary hyperparathyroidism, which causes hypercalcaemia.¹ Parathyroid hormone among other things induces increased osteoclast activity resulting in the mobilisation of more calcium in the bloodstream.¹ The consequences of tertiary hyperparathyroidism are osteoporosis and hypercalcaemia. Osteoporosis and orthopaedics are already familiar with each other, but in the literature there does not exist a clear correlation between hypercalcaemia and orthopaedic pathology. In this case report we believe that calcifications impaired the integrity of the cruciate ligaments and thus have made them more susceptible for rupture.

Patient

A 55 year old male is presented with instability of the left knee since a year and a half. He had chronic renal disease for 38 years and was undergoing intermittent haemodialysis. A kidney transplantation had

been rejected in the past. Treatment for his chronic renal failure was complicated by aluminium intoxication 22 years ago, resulting in severe osteomalacia and hypercalcaemia. Also, he developed a slowly progressive abnormal gait caused by polyneuropathy and osteomalacia. His complaints consisted of giving way and he denied a history of trauma. There was no pain or locking and he could walk several hundred metres with a walking stick. Physical examination revealed no effusion of the left knee and both knees had a normal range of motion. There was no instability and no tenderness. Remarkably, both hips had a positive Drehmann sign. Sensation was impaired on both sides. X-rays demonstrated mild degenerative abnormalities in both knees and calcifications of the soft tissues. No clear orthopaedic diagnosis could be made. The neurologist concluded that his complaints could be caused by polyneuropathy and side effects from his medication.

At the one yearly follow-up, physical examination revealed effusion of the left knee with limited flexion and lateral tenderness at hyperflexion and hyperextension. The Lachman stability test was negative. The left hip revealed no abnormalities. X-rays of the left knee demonstrated osteoarthritis, especially on the medial side, and calcifications of the soft tissues (Figure 1). MRI showed ruptures of both left cruciate ligaments. This was confirmed by arthroscopy and arthroscopic debridement was performed. Cytology of the synovial fluid showed no evidence of rheumatoid arthritis.

Two months after arthroscopy the patient suffered from persistent knee instability, pain and effusion of the right knee. Physical examination revealed adiposity, pes cavus of both feet, synovitis of the left knee and tenderness over the lateral joint space of the right knee. The Lachman stability test was positive on the right knee and flexion-extension was 0.0.110 degrees. X-rays revealed signifi-

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Figure 1. Lateral X-ray of the left knee. Note the peri-articular calcifications at the posterior aspect of the knee joint.

cant calcifications of the right knee and peri-articular in the pelvis. MRI demonstrated absence of the cruciate ligaments. This was confirmed by arthroscopy and extensive arthroscopic debridement was performed and specimens were taken from the synovium, tibial plateau, medial and lateral menisci, femoralcondyls and both ruptured cruciate ligaments for histopathological examination. This revealed several calcifications of both cruciate ligaments, including the tibial and lateral condyl insertions, and a tibial plateau with irregularities of the cartilage and degenerative abnormalities.

Intervention

- 2010: arthroscopy and debridement of the left knee: ruptured cruciate ligaments, cytology of synovial fluid showed no evidence of rheumatoid arthritis.
- 2011: arthroscopy and debridement of the right knee: ruptured cruciate ligaments, histopathological examination showed several calcifications of both cruciate ligaments, including the tibial and lateral condyl insertions, and a tibial plateau with irregularities of the cartilage and degenerative abnormalities.
- 2011: total left knee replacement.

Comparison

Our hypothesis is that the calcifications impaired the integrity of the cruciate ligaments in such a way that no trauma was required to cause complete rupture of the cruciate ligaments in both knees. A systematic review of the literature in PubMed yielded a limited amount of relevant articles (Table 1). The titles of the relevant articles were reviewed if they included any of the following terms: orthopaedics; rupture of the cruciate ligaments or tendons; calcium deposits. Only English or Dutch literature was included. We found the article of Tateyama and colleagues with the search query *anterior cruciate ligament AND calcium*.³ In this study the authors found a clear correlation between calcification of the thoracic aorta and calcium deposits in the anterior cruciate ligaments ($p = 0,02$) in human cadavers. They looked at correlations between the thoracic aorta and other tissues because calcification of the thoracic aorta is associated with osteoporosis.⁴ Aortic calcification is also associated with an increased risk of coronary heart disease, which is one of the major causes of mortality among patients with end stage renal disease.^{5, 6} More interesting, there is a correlation reported between hypercalcaemia and aortic calcification.⁷ The article from Grecomoro and colleagues was found with the search query *tertiary hyperparathyroidism AND rupture*.⁸ Here, the authors describe a patient with chronic renal disease, who had suffered from tertiary hyperparathyroidism and had a spontaneous rupture of his quadriceps tendons after falling on his knees. Both ultrasound and MRI confirmed the diagnosis. No other significant trauma preceded this event. They presumed that the tertiary hyperparathyroidism with severe osteoporosis as a consequence was the main cause of the spontaneous rupture of the quadriceps tendons. They believe that osteoporosis affected the tendon insertions in such a way that falling on his knees was enough to tear the tendons from the bone. Generalized osteoporosis with subperiosteal bone resorption leading to secondary weakness of the bone-tendon-junction, is the most common cause of spontaneous ruptures of tendons in patients with chronic renal

Table 1. This table shows search query's and results.

Mesh-terms/search query	Number of articles	Relevant
Anterior cruciate ligament AND calcium	48	1
Tertiary hyperparathyroidism AND anterior cruciate ligament	0	-
Tertiary hyperparathyroidism AND calcium deposits	2	0
Tertiary hyperparathyroidism AND rupture	3	1
Calcium deposits AND rupture	39	1
Osteoporosis AND anterior cruciate ligament	25	0

disease.⁹ Another important article was found with the search query *calcium deposits AND rupture*. Here, Taniguchi and colleagues describe spontaneous rupture of the extensor tendon of the fourth digit of the hand.¹⁰ They presumed that the cause of the rupture was secondary synovitis caused by calcium pyrophosphate dihydrate crystals.

Our patient did not suffer from tertiary hyperparathyroidism, but he did have hypercalcaemia. His medical history revealed aluminium intoxication 22 years ago (aluminium used to be the treatment for phosphate accumulations) and this leads, among other things, to hypercalcaemia and osteomalacia (which our patient also has).¹¹ We believe, together with the mentioned evidence in the literature, that the hypercalcaemia in this patient has led to calcium deposits in the cruciate ligaments. Histology of the cruciate ligaments confirmed this. In the literature there is a significant correlation between hypercalcaemia and calcification of the aorta and there is also a significant correlation between calcification of the (thoracic) aorta and calcium deposits in the anterior cruciate ligament.^{3,7} It is more than likely that these calcium deposits contributed to the spontaneous rupture of the cruciate ligaments in this patient. The etiology of spontaneous ruptures of tendons or cruciate ligaments in patients with chronic renal disease is multifactorial. Osteoporosis, as a consequence of tertiary hyperparathyroidism, contributes to a weak bone-tendon junction. Hypercalcaemia leads to calcium deposits in the cruciate ligaments or tendons and thereby impairing the integrity of these tissues and increasing stiffness. We believe that both processes can lead to spontaneous rupture of tendons, and as in our case report, of the cruciate ligaments. Our hypothesis is that calcium deposits in the cruciate ligaments induces spontaneous rupture of these tissues by impairing the integrity and increasing the stiffness. To our knowledge this theory has never been described in literature before. We recommend that patients with knee symptoms and osteoporosis or hypercalcaemia should be carefully evaluated. Osteoporosis and hypercalcaemia are often seen in patients with chronic renal disease, caused by secondary or tertiary hyperparathyroidism or medicines. More research should be performed to confirm our hypothesis. Also, hypercalcaemia should be treated first before considering a reconstruction of the cruciate ligaments.

Outcome

For the left knee, finally the patient received a total knee replacement resulting in alleviation of all the patients symptoms. An arthroscopy with extensive debridement of the right knee showed ruptured

cruciate ligaments. Histopathological examination showed several calcifications of both cruciate ligaments, including the tibial and lateral condyl insertions, and a tibial plateau with irregularities of the cartilage and degenerative abnormalities. At the follow-up the patient did not have any complaints of instability of the right knee and the left knee prosthesis functioned well. Therefore, at this point there is no indication for a total right knee replacement.

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Conflict of interests

There are no potential conflicts of interest to declare.

References

1. Fraser WD. Hyperparathyroidism. *Lancet*. 2009 Jul 11;374(9684):145-58.
2. Young EW, Akiba T, Albert JM, McCarthy JT, Kerr PG, Mendelssohn DC, et al. Magnitude and impact of abnormal mineral metabolism in hemodialysis patients in the Dialysis Outcomes and Practice Patterns Study (DOPPS). *Am J Kidney Dis*. 2004 Nov;44(5 Suppl 2):34-8.
3. Tateyama Y, Takano Y, Tohno Y, Moriwake Y, Tohno S, Hashimoto M, et al. Correlations of calcium accumulations in arteries, veins, cartilages, ligaments, and bones in single humans. *Biol Trace Elem Res*. 2000 Jun;74(3):211-21.
4. Vogt MT, San Valentin R, Forrest KY, Nevitt MC, Cauley JA. Bone mineral density and aortic calcification: the Study of Osteoporotic Fractures. *J Am Geriatr Soc*. 1997 Feb;45(2):140-5.
5. Foley RN, Murray AM, Li S, Herzog CA, McBean AM, Eggers PW, et al. Chronic kidney disease and the risk for cardiovascular disease, renal replacement, and death in the United States Medicare population, 1998 to 1999. *J Am Soc Nephrol*. 2005 Feb;16(2):489-95.
6. Iribarren C, Sidney S, Sternfeld B, Browner WS. Calcification of the aortic arch: risk factors and association with coronary heart disease, stroke, and peripheral vascular disease. *JAMA*. 2000 Jun 7;283(21):2810-5.
7. Noordzij M, Cranenburg EM, Engelsman LF, Hermans MM, Boeschoten EW, Brandenburg VM, et al. Progression of aortic calcification is associated with disorders of mineral metabolism and mortality in chronic dialysis patients. *Nephrol Dial Transplant*. 2011 May;26(5):1662-9.
8. Grecomoro G, Camarda L, Martorana U. Simultaneous chronic rupture of quadriceps tendon and contra-lateral patellar tendon in a patient affected by tertiary hyperparathyroidism. *J Orthop Traumatol*. 2008 Sep;9(3):159-62.
9. Shiota E, Tsuchiya K, Yamaoka K, Kawano O. Spontaneous major tendon ruptures in patients receiving long-term hemodialysis. *Clin Orthop Relat Res*. 2002 Jan(394):236-42.
10. Taniguchi Y, Yoshida M, Tamaki T. Subcutaneous extensor tendon rupture associated with calcium pyrophosphate dihydrate crystal deposition disease of the wrist. *J Hand Surg Br*. 1997 Jun;22(3):386-7.
11. Delmez JA, Slatopolsky E. Hyperphosphatemia: its consequences and treatment in patients with chronic renal disease. *Am J Kidney Dis*. 1992 Apr;19(4):303-17.

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PROMs for assessing outcome after hallux valgus surgery. Where do we stand and which road to follow?

Joost C.M. Schrier, Angelique G.H. Witteveen, Justus Jansen and Sander Koeter

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Introduction

Hallux valgus surgery is among the most common performed procedure within orthopaedic practice.¹ The prevalence ranges from 2% to 4% of the population; more than 90% of patients are women.²⁻⁴ The main purpose of operative treatment is to decrease pain and correct the deformity, thereby improving quality of life.⁵ Nevertheless, no reliable improvement in quality of life has been reported in literature. As a result, the optimal method of treatment remains disputed.^{6,7}

In literature, a wide range of clinical outcome measurement tools are used.^{8,9} Most measurement tools are not specifically developed and have not been adequately evaluated for this purpose.^{9,10} In fact, many currently used foot and ankle outcome instruments, do not focus on factors which are of primary importance to patients.¹¹

Applied hallux valgus outcome measures in Dutch practice

The authors of this article conducted a survey among Dutch orthopaedic surgeons assessing the current use of patient-reported outcome measures (PROMs) directed at hallux valgus in daily practice (Table 1). An internet link for an online survey was sent by email to all members of the Dutch Orthopedic Foot and Ankle Association (DOFAA). Forty-three surgeons responded to the web-based survey, of whom 60.5% were working in medium size or large peripheral hospitals, 25.6% in small peripheral or private clinics and 9.3% in academic hospitals.

Nine respondents (21%) used PROMs, specifically directed at hallux valgus, in daily practice. Also, 21% applied PROMs, directed at quality of life,

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Table 1. Overview of the online survey content

1. What kind of hospital do you work for?
2. Do you use PROMs, directed at hallux valgus, in daily practice?
3. If so, what kind of PROM?
4. Do you use PROMs measuring quality of life in a population with hallux valgus?
5. If so, what kind of PROM?
6. Do you use PROMs in case of other foot-/ ankle pathology?
7. If so, what kind of PROM?
8. In what way do you obtain a PROM?

within the patient population with hallux valgus (not identical to the previous 21%). In patients with foot or ankle pathology, other than hallux valgus, 14 respondents used PROMs as well.

Various measurement tools were applied, to evaluate outcome after hallux valgus surgery (Table 2). However, only 3 respondents (7%) used a true PROM, such as the Foot Ankle Outcome Score (FAOS) or the Manchester Oxford Foot Questionnaire (MOXFQ). In addition to these specific PROMs, several respondents indicated application of the SF-36 or EQ5d as PROM directed at quality of life.

This survey shows that the majority of responding foot and ankle surgeons do not use outcome measurement tools for evaluation of hallux valgus surgery, let alone a PROM. The absence of a valid and reliable Dutch PROM directed at hallux valgus could be an important reason.

Quality of care and its future

With an increasing demand for quality of health care and evaluation of its effectiveness, there is a present urge for the use of patient reported outcome measurements in our health care system. The Dutch Orthopaedic Association (Nederlandse Orthopaedische Vereniging, NOV) has created a guideline to implement PROMs in orthopaedic practice (<http://www.orthopeden.org/kwaliteit/proms>). This initiative is an important step to fur-



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Table 2. Overview of the outcome measurement tools used for evaluation of hallux valgus surgery.

Type	Number
AOFAS; exclusively for research purpose	2
VAS and paragraph regarding function of AOFAS	1
FFI	4
FAOS	2
MOXFQ	1
Total	10

Abbreviations: AOFAS: American Orthopedic Foot Ankle Society Score; VAS: Visual Analogue Scale; FFI: Foot Function Index; FAOS: Foot Ankle Outcome Score MOXFQ: Manchester Oxford Foot Questionnaire

ther enhance and monitor quality of orthopaedic care, and subscribes the need for a valid and reliable Dutch PROM directed at hallux valgus. Obtaining these PROMs, through uniform outcome measurement tools, could result in improved evidence-based decision making, by patients and doctors. Also it could result in improved quality and reduced costs, assuming that costly complications occur less frequently with higher quality.

Which hallux valgus PROMs are available?

At present the authors have identified only 2 outcome measurement tools that are validated as a disease specific PROM in hallux valgus surgery: the Manchester Oxford Foot Questionnaire (MOXFQ) and the Foot Ankle Outcome Score (FAOS).^{1,8,12-15} The MOXFQ has been specifically designed for hallux valgus surgery. This score has been validated across certain foot ankle conditions, with hallux valgus in specific, and has good reliability and responsiveness.^{14,16,17} No floor and ceiling effects were demonstrated in a patient population undergoing foot or ankle surgery.¹⁴ This score is increasingly being used by European foot ankle surgeons, and is currently being translated into Dutch.¹⁷ However, a copyright licence is required for any use of the score, with administration fees for translated versions (<http://isis-innovation.com/outcomes/orthopaedic/moxfq.html>). The FAOS, although it has originally been validated for patients after ankle ligament reconstruction¹⁵, has also been validated for the use in hallux valgus surgery.¹² The questionnaire is quite extensive, possibly leading to reduced readability and comprehension. The sports and recreation subscale of the FAOS showed little responsiveness to hallux valgus surgery. Ceiling effects were present for

the ADL and sports subscale.¹² This tool is translated into Dutch.¹⁸

Which road to follow?

The common prevalence of hallux valgus indicates the obvious need for general consensus on outcome measurement. None of the available PROMs, regarding hallux valgus, meet all the criteria that an ideal score should possess according to the NOV (Table 3).

Table 3. Criteria for PROMs recommended by the NOV

1. Validated Dutch Version
2. Limited length of the questionnaire, preferable less than 10 questions
3. Used in international registrations
4. Future proof: can measure effect in various patient groups/ small ceiling effect
5. Informative: PROM measures information on outcome
6. No license needed

Despite the copyright license and administration fees, we currently consider the MOXFQ as the most suitable outcome measurement in the treatment of hallux valgus. Its success will importantly depend on international acceptance and use. We should await the current Dutch translation and validation process, without developing alternatives. Additionally, we encourage the Dutch hallux valgus guideline to include an advice on the use of this PROM.

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In case of publication of this manuscript in the NTvO all rights, related to this manuscript, will be transferred to the Dutch Orthopedic Association (NOV).

References

1. Dawson J, Doll H, Coffey J, Jenkinson C, Oxford and Birmingham Foot and Ankle Clinical Research Group. Responsiveness and minimally important change for the Manchester-Oxford foot questionnaire (MOXFQ) compared with AOFAS and SF-36 assessments following surgery for hallux valgus. *Osteoarthritis Cartilage* 2007 Aug;15(8):918-931.
2. Coughlin MJ, Jones CP. Hallux valgus: demographics, etiology, and radiographic assessment. *Foot Ankle Int* 2007 Jul;28(7):759-777.
3. Myerson M, Allon S, McGarvey W. Metatarsocuneiform arthrodesis for management of hallux valgus and metatarsus primus varus. *Foot Ankle* 1992 Mar-Apr;13(3):107-115.

4. Nix S, Smith M, Vicenzino B. Prevalence of hallux valgus in the general population: a systematic review and meta-analysis. *J Foot Ankle Res* 2010 Sep 27;3:21-1146-3-21.
5. Saro C, Jensen I, Lindgren U, Fellander-Tsai L. Quality-of-life outcome after hallux valgus surgery. *Qual Life Res* 2007 Jun;16(5):731-738.
6. Choi WJ, Yoon HK, Yoon HS, Kim BS, Lee JW. Comparison of the proximal chevron and Ludloff osteotomies for the correction of hallux valgus. *Foot Ankle Int* 2009 Dec;30(12):1154-1160.
7. Trnka HJ, Zembsch A, Easley ME, Salzer M, Ritschl P, Myerson MS. The chevron osteotomy for correction of hallux valgus. Comparison of findings after two and five years of follow-up. *J Bone Joint Surg Am* 2000 Oct;82-A(10):1373-1378.
8. Dawson J, Coffey J, Doll H, Lavis G, Cooke P, Herron M, et al. A patient-based questionnaire to assess outcomes of foot surgery: validation in the context of surgery for hallux valgus. *Qual Life Res* 2006 Sep;15(7):1211-1222.
9. Hunt KJ, Hurwit D. Use of patient-reported outcome measures in foot and ankle research. *J Bone Joint Surg Am* 2013 Aug 21;95(16):e118(1-9).
10. Dux K, Smith N, Rottier FJ. Outcome after metatarsal osteotomy for hallux valgus: a study of postoperative foot function using revised foot function index short form. *J Foot Ankle Surg* 2013 Jul-Aug;52(4):422-425.
11. Baumhauer JF, McIntosh S, Reichtine G. Age and sex differences between patient and physician-derived outcome measures in the foot and ankle. *J Bone Joint Surg Am* 2013 Feb 6;95(3):209-214.
12. Chen L, Lyman S, Do H, Karlsson J, Adam SP, Young E, et al. Validation of foot and ankle outcome score for hallux valgus. *Foot Ankle Int* 2012 Dec;33(12):1145-1155.
13. Dawson J, Fitzpatrick R, Murray D, Carr A. Questionnaire on the perceptions of patients about total knee replacement. *J Bone Joint Surg Br* 1998 Jan;80(1):63-69.
14. Dawson J, Boller I, Doll H, Lavis G, Sharp R, Cooke P, et al. The MOXFQ patient-reported questionnaire: assessment of data quality, reliability and validity in relation to foot and ankle surgery. *Foot (Edinb)* 2011 Jun;21(2):92-102.
15. Roos EM, Brandsson S, Karlsson J. Validation of the foot and ankle outcome score for ankle ligament reconstruction. *Foot Ankle Int* 2001 Oct;22(10):788-794.
16. Maher AJ, Kilmartin TE. An analysis of Euroqol EQ-5D and Manchester Oxford Foot Questionnaire scores six months following podiatric surgery. *J Foot Ankle Res* 2012 Jul 9;5(1):17-1146-5-17.
17. Morley D, Jenkinson C, Doll H, Lavis G, Sharp R, Cooke P, et al. The Manchester-Oxford Foot Questionnaire (MOXFQ): Development and validation of a summary index score. *Bone Joint Res* 2013 Apr 3;2(4):66-69.
18. van den Akker-Scheek I, Seldentuis A, Reininga IH, Stevens M. Reliability and validity of the Dutch version of the Foot and Ankle Outcome Score (FAOS). *BMC Musculoskelet Disord* 2013 Jun 11;14:183-2474-14-183.

Noot van de redactie

This article was submitted to our journal by the authors as an original paper. It was however not deemed fit for publishing as a scientific paper, lacking an actual description of clinical use of the PROMs used for example. Nevertheless, the editorial board attaches great importance to publishing articles using PROMs. It is desirable that PROMs are developed to measure and compare outcome, so that patients, society and perhaps also orthopaedic surgeons can 'pick their own winners'. It is of even more importance that such a PROM is developed by the clinicians that are responsible for delivering the care and not by politicians that have to make difficult decisions concerning the reimbursement of these forefoot procedures.

The point that is raised by this report is that we are a long way from a uniform PROM for this particular area of orthopaedics. Only one out of five surgeons use outcome measures in their practice and only one out of fifteen use true PROMs. So far, no publication in this journal (or let alone -so far as we could find- on PubMed) has published their results.

The editorial board would like to invite those pioneers to report their results through this Journal. They need not keep to the PROM suggested in this report. It need not even be in the form of a randomized controlled trial. Apparently, only one exists concerning the clinical evidence for hallux valgus treatment, showing that an immediate distal chevron osteotomy is superior to orthosis treatment with similar costs after two years*. Against that background there is still place to show results of case series that have adequately been followed-up. If we fail to show our worth, it is likely that insurance companies will at some point notice and suspend reimbursement for our work for these patients.

*Torkki M, Malmivaara A, Seitsalo S, Hoikka V, Laippala P, Paavolainen P. *Hallux valgus: immediate operation versus 1 year of waiting with or without orthoses: a randomized controlled trial of 209 patients. Acta Orthop Scand. 2003 Apr;74(2):209-15*

Hans Hendriks en Taco Gosens

Proefschriftbespreking

On rotator cuff tears. Studies on evaluation, clinical outcome and surgical treatment. Peer van der Zwaal, LUMC, 27 februari 2013

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In 2013, on February 27th, Peer van der Zwaal successfully presented his thesis on this highly prevalent disorder.

His goal was to create better understanding of the evaluation, clinical outcome and surgical treatment of these degenerative rotator cuff tears.

His first study is on a useful classification system. Van der Zwaal describes a retrospective study to assess the intra- and inter-observer conformity on the Geometric Classification (by Davidson in 2005 on conventional MRI) of rotator cuff tears using MR-arthrography, and thereby he evaluates whether the classification is useful as a practical tool in daily practice. He concludes that the Geometric Classification and the 2-dimensional measurement of rotator cuff tears showed by MR-arthrography has good to excellent intra-observer agreement and moderate to good inter-observer agreement.

Shoulder symptoms are not necessarily the consequence of an observed rotator cuff tear. In chapter 4 he describes the design of an easy-to-use method to evaluate adductor co-activation (teres major and latissimus dorsi) in order to prevent pain as a result of humeral head cranialization and to identify symptomatic cuff tear patients. By EMG-recorded isometric arm abduction and adduction tasks, he defines the Activation Ratio, where lower values express more co-activation. This method has potential as an objective outcome measure for distinguishing symptomatic from asymptomatic tears, and as a tool for clinical decision-making.

The importance of the shoulder in upper limb function mandates early detection and treatment of rotator cuff disease before irreversible functional loss sets in. In chapter 5 he describes the progression of rotator cuff disease in a cohort of RA patients one of the larger subpopulations for rotator cuff tears, with shoulder pain over an eight-year period. The conclusion was that progression of rotator cuff disease in RA is associated with the severity of the disease activity in the shoulder, as reflected by upward migration of the humeral head (Upward migration index, UMI) and advanced articular destruction on an anteroposterior X-ray.

In literature, several studies have been published comparing the results of the mini-open to the all-arthroscopic cuff repair procedure. Many of them are retrospective and non-randomised. In chapter

6, a prospective randomised controlled trial is described. In both procedures, a double row technique was used. No significant differences were seen between the two techniques in the first year when comparing functional outcome, pain, range of motion and complication. Patients did attain the benefits of treatment somewhat sooner with the arthroscopic procedure after 6 weeks.

Detection (MRI) of degenerative subscapularis tendon tears has increased together with advances in surgical treatment modalities. In Chapter 7, the authors present a study that conclude that an all arthroscopic repair is an effective treatment modality for degenerative subscapularis tendon tears with good clinical results and high patient satisfaction. Still, fatty muscle infiltration was progressive in more than half of the patients, despite a healed repair. We see an increasing number of active patients seeking medical attention for massive, contracted cuff tears. Primary repair of such tears has an inconsistent outcome and is associated with higher percentage re-tear. However, a successful repair may prevent joint degeneration. In chapter 8 and 9 surgical treatment modalities for massive cuff tears are discussed; The shoestring Bridge Technique is introduced as an effective treatment for massive, contracted supraspinatus and infraspinatus tendon tears. An interesting point of discussion in this technique is the fixation to the greater tubercle with a single bone anchor in these massive tears, where double row technique is in vogue.

Irreparable posterosuperior rotator cuff tears can be treated by latissimus dorsi transfer or teres major transfer, in order to increase external rotation in elevated arm position and to have pain relief. In a prospective cohort study the clinical results of patients who underwent a teres major tendon transfer are evaluated.

The thesis of Peer van der Zwaal gives us tools for a reliable identification of rotator cuff pathology in order to allocate patients to a specific treatment strategy. He ends his thesis with: "The most challenging aspect will be to distinguish those patients requiring non-surgical management from those requiring surgical treatment".

Chris M. van den Broek

Praktijkvariatie knie- en heupartrose Achtergrondinformatie

Eerder dit jaar publiceerde ZN praktijkvariatiegegevens betreffende knie- en heupartrose, naar aanleiding van een NPCF-verzoek. Mede omdat dit rapport bij uw overleg met zorgverzekeraar(s) en/of Raad van Bestuur ter sprake kan komen, stelde de NOV een achtergrondnotitie op. Dit artikel geeft een samenvatting; de volledige notitie vindt u op de NOV-site*.

De praktijkvariatie geeft aan of en welk verschil er is tussen regio's en instellingen in het aantal knie- of heupvervangingen vanwege artrose. De indicator praktijkvariatie wordt gedefinieerd als: het aantal operatieve interventies per 100.000 verzekerden in de regio, gecorrigeerd voor relevante patiëntkenmerken (leeftijd, geslacht, SES en co-morbiditeit). Bij 'heupvervangings vanwege artrose' is de spreiding op instellingsniveau in 2011 een factor 2,02; bij 'knievervangings vanwege artrose' is dit een factor 2,55. De cruciale vraag is wat deze praktijkvariatie betekent. Elke patiënt is immers uniek en er zijn demografische verschillen tussen regio's en tussen de patiëntengroepen van instellingen. Toch is het raadzaam de gegevens goed te beschouwen, want:

- 'Weinig operaties' kan wijzen op onderbehandeling; een patiënt loopt de kans niet geopereerd te worden, terwijl dat wel nodig is.
- 'Veel operaties' kan wijzen op overbehandeling; een patiënt wordt wellicht onnodig geopereerd, terwijl een operatie altijd risico's met zich meebrengt.

De genoemde factoren geven hierover op zichzelf geen uitsluitel; ze geven wel aanleiding voor nadere analyse en onderzoek. Een variatie krijgt vooral pas betekenis als er een koppeling is met uitkomstenmaten van zorg, zoals in de PROMS.

Commentaar

De Orde van Medisch Specialisten (OMS) heeft namens de wetenschappelijke verenigingen commentaar gegeven op het ZN-rapport:

1. De OMS juicht het streven naar meer transparan-

tie in de zorg van harte toe en verwelkomt het rapport. Tegelijkertijd is de OMS bezorgd over het feit dat er aan de cijfers nauwelijks betekenis kan worden ontleend, waardoor er een vertekend beeld kan ontstaan; bijvoorbeeld dat elke praktijkvariatie verkeerd is.

2. De OMS plaatst kanttekeningen bij de gehanteerde methodiek. Deze zorgt voor allerlei interpretatieproblemen en staat betekenisvolle en vergelijkbare informatie voor (toekomstig) patiënten en medisch specialisten in de weg:
 - a. ZN kan de medisch specialisten geen inzicht geven in de brondata;
 - b. ZN maakt gebruik van declaratiegegevens; dit zijn geen handelingsdata van medisch specialisten;
 - c. de optimumvariatie is niet bepaald (het nulpunt tussen over- en onderbehandeling);
 - d. demografische en sociaal-economische factoren worden onvoldoende gecorrigeerd in de cijfers.
3. Wanneer transparantie een doel op zichzelf wordt, heeft dit een eenzijdige focus op de prestaties van de medische sector tot gevolg. Een afrekencultuur in de medische sector draagt niet bij aan goede zorg, maar ondermijnt juist het patiëntenvertrouwen en zet het reflecterend vermogen van medisch specialisten onder druk.

Aanvullend NOV-commentaar

4. Het rapport suggereert dat variatie als zodanig ongewenst is, maar aangezien voor de dokter de kwaliteit van zorg voor de individuele patiënt op de eerste plaats staat, zal er altijd een bepaalde mate van variatie in behandeling blijven bestaan. Het gaat erom te duiden welke (variatie van) behandeling ongewenst is.
5. Een indicator als praktijkvariatie dient in een breder kader te worden gezien; verabsolutisering kan leiden tot volledige rationalisering van de zorg, waarbij geen ruimte blijft voor het afstemmen van zorg op de individuele patiënt.
6. Bij de interpretatie van cijfers over praktijkvariatie dienen de bijbehorende richtlijnen in ogenschouw te worden genomen, bijvoorbeeld wat betreft de indicatiestelling en de behandelstrategie.

* www.orthopeden.org, nieuwsitem 22 april 2014.

7. Instellingen kunnen op basis van specialisaties onderlinge afspraken hebben, waardoor variatie ontstaat.
8. De regionale cultuur (= voorkeur van patiënten) kan invloed hebben.
9. Regionale verschillen in persoonskenmerken (bijvoorbeeld obesitas) tellen mee.
10. Er is in de grensgebieden onvoldoende zicht op de mogelijke invloed van ingrepen in het buitenland.
11. De postcode van de patiënt is in het rapport leidend. Uit onderzoek (NVZ, 2011) blijkt echter dat 25% van de patiënten niet voor het dichtstbijzijnde ziekenhuis kiest. Wachttijden tellen ook mee en kunnen in dezen een verklaring vormen voor de variatie.

NOV-activiteiten

De data zijn van 2011. De afgelopen drie jaar heeft de NOV onderstaande activiteiten ondernomen om een eventuele ongewenste praktijkvariatie te beperken c.q. te voorkomen:

- * Stimuleren van aandacht voor de juiste indicatiestelling vanuit de beroepsgroep via systematische ontwikkeling van nieuwe richtlijnen.
- * Via de kwaliteitsvisitaties toezicht en controle op de stringente toepassing van richtlijnen en/of standpunten.
- * Instellen Audit Teams Orthopedie.
- * Start PROMs en koppeling aan de LROI.

Chris van der Togt,
directeur NOV, nov@orthopeden.org

Nordic Orthopaedic Federation 57th NOF-Congres, 7 - 9 mei 2014

De Nordic Orthopaedic Federation (NOF) heeft in haar strategisch plan drie hoofddoelen geformuleerd: de samenwerking tussen de NOF-lidorganisaties en hun leden verbeteren; optimaliseren van de zorgkwaliteit; een betere communicatie. Het 57ste NOF-congres, afgelopen mei gehouden in Helsinki, Finland, stond mede in het teken van deze doelen. Er waren ruim 500 deelnemers, waaronder 45 vanuit Nederland.

Vanwege de genoemde doelen was er rondom het wetenschappelijk programma veel aandacht voor discussie en de uitwisseling van onderzoeksresultaten en ervaringen. Zo konden de NOF-leden hun visie op orthopedie en op het orthopedisch en maatschappelijk landschap vanuit de verschillende landen verder verbreden en verdiepen.

Aare Märtson NOF-president

Tijdens de General Assembly op 8 mei is dr. Aare Märtson (Estland) tot NOF-president verkozen. Prof. dr. Li Fellander-Tsai (Zweden) is de nieuwe NOF-vice-president. Dr. Jan van Mourik is de NOF-secretaris-generaal. Het NOF-bestuur bestaat verder uit de voorzitters van de zeven aangesloten orthopedische verenigingen, voor de NOV is dat Henk Koot.

Göran Bauer's Grant 2014

Deze beurs is toegekend aan C. Skovgaard Nielsen (Denemarken) en aan O. Rolfson (Zweden). NB. In 2012 ontving Chris Arts de Göran Bauer Grant. Hij deelde de beurs (€ 10.000,-) toen met de Deen Anders Troelsen. De NOF heeft deze beurs ingesteld ter nagedachtenis aan professor Göran Bauer, een Zweedse orthopedisch chirurg. De beurs is bedoeld om studiereizen naar orthopedische onderzoeks-



www.norf.org

centra te ondersteunen en om wetenschappelijke bijeenkomsten mogelijk te maken.

NOF Congress Grants 2014

Ter ondersteuning van opleiding en wetenschappelijk onderzoek door bijna en recent afgestudeerde orthopedisch chirurgen, voorziet de NOF in een NOF Congress Grant. Tot een bedrag van € 1000,- dekt deze beurs de reis- en verblijfkosten naar het NOF Congres. Jaroma Antti (Finland), Jan Duedal Rölfing (Denemarken) en Simo Miettinen, (Finland) ontvingen dit jaar deze beurs. Noteer deze mogelijkheid alvast voor de volgende editie in 2016 (in Zweden).

NOF Instructional Course

De NOF faciliteert de organisatie van cursussen door en in samenwerking met de NOF-lidorganisaties. Deze mogelijkheid is er in het voor- en in het najaar. Het betreft ondersteuning in PR en in het afdekken van het organisatierisico. Aan deze ondersteuning is vanzelfsprekend een aantal voorwaarden verbonden.

Chris van der Togt,
directeur NOV, nov@orthopeden.org

Zorg voor beweging Jaarmagazine 2015 Nieuw: met eigen Special

Maatschappen, vakgroepen en ZBC's kunnen Zorg voor beweging Jaarmagazine voortaan ook inhoudelijk een eigen en doelgerichte uitstraling geven. Naast een eigen achterzijde kunnen zij namelijk kiezen voor een eigen Special in het hart van het magazine. Deze vier pagina's worden op maat geschreven, gefotografeerd en vormgegeven.



De redactie van Zorg voor beweging Jaarmagazine is volop bezig met de invulling van het Jaarmagazine 2015. Qua inhoud en uitstraling borduurt deze voort op de huidige uitgave. Nieuw is de mogelijkheid om het Jaarmagazine nog meer een lokale en maatschap / vakgroep-eigen uitstraling mee

te geven. Dat kan via een Special van vier pagina's die aan het totale magazine worden toegevoegd. Dit gebeurt in combinatie met een vermelding op de cover. Voor de invulling van de Special maakt iedere maatschap/vakgroep een eigen plan; zij kunnen bijvoorbeeld een specifiek aandachtsgebied etaleren (voorbeeld 1) of focussen op de breedte van het aanbod en alle maten voorstellen (voorbeeld 2). Een ander voorbeeld is de koppeling van inhoud en sfeer (voorbeeld 3). Van deze voorbeelden ziet u hier de twee middenpagina's van de Special. De Special opent en sluit met een enkele pagina. Advies over bijvoorbeeld een strategische profilering en de juiste aansluiting op de overige communicatie, is verkrijgbaar bij de NOV. Het vaste Zorg voor beweging productieteam maakt een op maat gesneden voorstel voor iedere Special, inclusief een foto voor de achterzijde.

Een eigen Special

- Vier pagina's in het hart van het magazine.
- Vermelding Special op de cover.
- Inclusief foto voor eigen achterzijde.
- Eigen plan en inhoud.
- Valt op hoofdlijnen binnen verantwoordelijkheid Zvb redactie.
- Advies beschikbaar bij NOV.
- Het betreft een overeenkomst met het productieteam.

Meer informatie, ook over de kosten, staat op de NOV-site in het nieuwsitem van 19 mei 2014. Er volgen nog meer berichten. Het is mogelijk een vrijblijvend voorstel op maat te ontvangen. Wie belangstelling heeft, mailt naar nov@orthopeden.org.

Gabriëlle Kuijer, communicatieadviseur
NOV, communicatie@orthopeden.org



Voorbeeld 1: Etaler een specifiek aandachtsgebied.



Voorbeeld 2: Focus op totale aanbod en stel collega's voor.



Voorbeeld 3: Koppel sfeer en inhoud.

Vol
21

jun
'14

Vernieuwd LROI-dashboard gereed

Begin april jl. is het sterk verbeterde LROI-dashboard in gebruik genomen. Alle LROI-contactpersonen van de vakgroepen en maatschappen hebben de inloggegevens en informatie ontvangen.

Via het nieuwe LROI-dashboard kan elke vakgroep of maatschap overzichten maken van de geregistreerde gegevens. Dit geeft nog beter inzicht in de patiëntenpopulatie en de geplaatste implantaten. Als bijkomend voordeel worden de gegevens gespiegeld aan landelijke gegevens. Dit leidt tot meer inzicht in hoe de lokale gegevens zich verhouden ten opzichte van de landelijke cijfers.

Enkele kenmerken van het nieuwe dashboard:

- Direct een overzicht van het aantal geregistreerde heup- en knieprothesen.
- Per gewricht (heup en knie) een overzicht van het aantal registraties.
- Leeftijdverdeling van de patiënten (te filteren voor diverse variabelen) ten opzichte van de landelijke verdeling.
- Verdeling in ASA-score van de vakgroep/maatschap ten opzichte van de landelijke verdeling.
- Overzicht van de prothesen die in de vakgroep/maatschap zijn gebruikt.
- De redenen voor revisie voor de vakgroep/maatschap en ten opzichte van de landelijke verdeling.

Vanaf de lancering op 11 april 2014 hebben al 63 ziekenhuizen gebruikgemaakt van het vernieuwde dashboard.

Toekomst

Momenteel werkt de LROI aan de mogelijkheid om de eventuele datum van overlijden van een patiënt in de database op te nemen. Deze datum is nodig om de survival van de prothese te kunnen berekenen. Als deze mogelijkheid er is, zal op termijn ook de survival binnen een instelling op het dashboard weergegeven kunnen worden. Dit geeft nog beter inzicht in de resultaten.

Sinds eind 2013 kunnen er ook Patient Reported Outcome Measures (PROMs) worden geregistreerd in de LROI. Deze uitkomstmaat geeft zicht op de kwaliteit van zorg, gezien vanuit het perspectief van de patiënt. Bij voldoende vulling zal ook deze uitkomstmaat op het dashboard weergegeven worden.

Het dashboard blijft aldus voortdurend in beweging; maak er gebruik van.

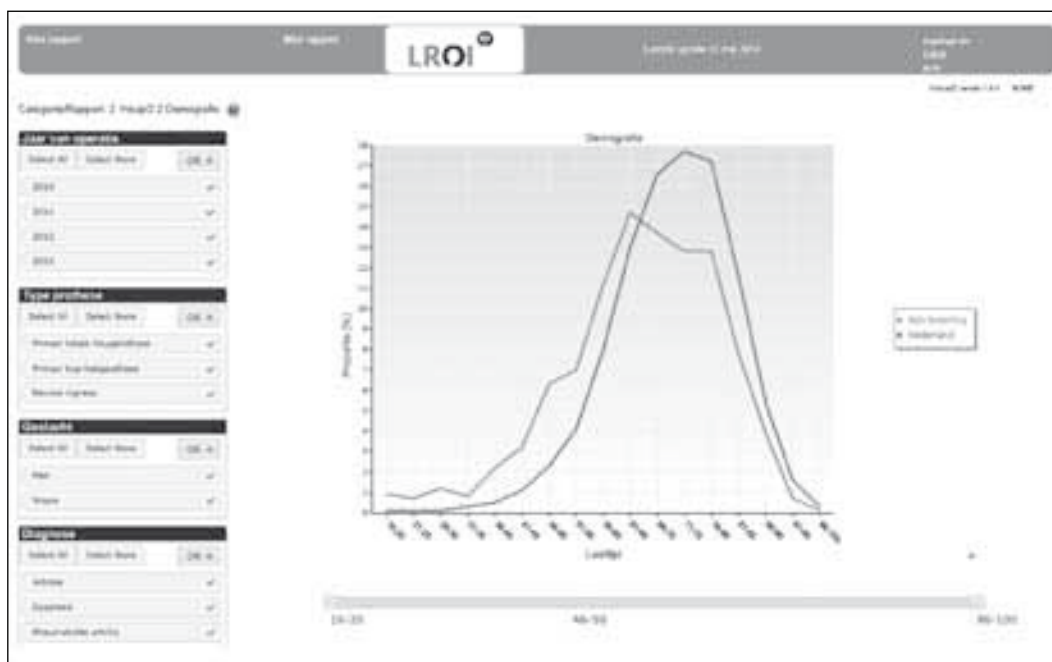
Geke Denissen,

projectcoördinator LROI, lroi@orthopeden.org

Gratis LROI-infographics als poster

Wilt u patiënten op een eenvoudige manier informatie geven over hoeveel THP/TKP in Nederland worden geplaatst, bij wie en waarom? Maak gebruik van de LROI-infographics.

- U kunt ze als pdf downloaden via www.lroi.nl/nl/patienteninformatie/voor_u
- U krijgt ze gratis op A3 formaat toegestuurd
- Ze zijn als slide beschikbaar voor uw wachtkamerbeeldschermen (lroi@orthopeden.org)



Screenshot LROI-dashboard Leeftijdverdeling.

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^[1] Mid- to long-term survivorship of an anatomical shoulder prosthesis. Irlenbusch U, Berth A, Blatter G, Zenz P. White Paper, Mathys Ltd Bettlach, 2013.

^[2] Mid-term survival rates of an anatomical shoulder prosthesis. Zenz P, Berth A, Blatter G, Irlenbusch U. Data were presented at ÖGO Congress, 12–14 September 2013.



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