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ANCHOR surgeon views of patient selection and expectations for periacetabular osteotomy

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ABSTRACT

Preoperative expectations impact shared decision making and patient satisfaction. Surgeon views of patient selection, expected outcomes and patient expectations after periacetabular osteotomy (PAO) for treatment of acetabular dysplasia have not been defined. We assessed surgeon views of patient selection and expected outcomes after PAO. A sample of experienced PAO surgeons participated in semi-structured phone interviews assessing: (i) factors that determine patient candidacy for PAO; (ii) surgeon expectations for PAO outcomes; (iii) surgeon perceptions of patient expectations for PAO outcomes and (iv) surgeon perceptions of discrepancies in surgeon and patient expectations and approaches for reconciling these discrepancies. Twelve surgeons (77% of PAO-performing ANCHOR surgeons) participated. The factors most commonly mentioned in determining patient candidacy for PAO were: symptoms, radiographic findings, absence of arthritis and age. Only one-quarter of the sample mentioned patient expectations as a factor in determining patient candidacy for PAO. The most common surgeon expectations were: pain reduction, joint preservation, function with activities of daily living and return to desired activities. 58% of surgeons felt that surgeon and patient expectations align most of the time. Common expectation discrepancies included return to unrestricted activities and complete pain relief. Detailed discussion was the most commonly employed strategy to resolve expectation discrepancies. PAO surgeons felt that patient expectations of complete pain relief and return to unrestricted activities were misaligned with their own expectations. Development of an expectations survey may facilitate shared decision making.

INTRODUCTION

Acetabular dysplasia is a spectrum of abnormal hip morphology characterized by deficient femoral head coverage. The Bernese periacetabular osteotomy (PAO) [1] is an acetabular reorientation procedure that provides improvement in pain and function to individuals with symptomatic hip dysplasia [2–4]. Good outcomes, however, are not uniform following PAO. Certain patient factors have been associated with early failure including age, severity of symptoms prior to surgery, the status of the hip joint cartilage and congruency following reorientation [3–7].

There has been an increasing recognition that preoperative expectations may also be an important determinant of

the patient-perceived outcome of elective orthopedic procedures [8–12]. Moreover, previous studies have shown that discordance between patient and surgeon expectations prior to surgery may negatively impact outcome [13–16] and that interventions to reduce expectation discrepancies can be effective [17]. Beyond impacting the outcome of surgery, expectations may play an important role in decision making on whether to proceed with surgery [18]. No data currently exist on the impact of surgeon or patient preoperative expectations on decision making and outcomes of PAO. A more in-depth understanding of surgeon views on patient selection and expectations for PAO outcomes may facilitate development of tools to reduce

Table I. Surgeon demographics

| <i>Surgeon characteristics</i> | | |
|--------------------------------|------------------|--------|
| <i>Variable</i> | <i>Mean (SD)</i> | |
| Age (years) | 50.4 (9.1) | |
| Sex | Male | 100% |
| | Female | 0% |
| Ethnicity | Hispanic | 16.70% |
| | Non-hispanic | 83.30% |
| Race | White | 91.70% |
| | African American | 0.00% |
| | Asian | 8.30% |
| Years in practice | 17.5 (9.5) | |
| Years performing PAO | 15.1 (6.6) | |
| PAO performed per year | 53.5 (35.1) | |

PAO, periacetabular osteotomy.

expectation discrepancies and enhance shared decision making for patients considering PAO.

In this study, we asked: (i) What are the views of experienced PAO surgeons with respect to factors deemed important for determining candidacy for PAO? (ii) What are surgeon expectations for outcomes following PAO? (iii) What are surgeon perceptions of patient expectations for outcome following PAO? (iv) What are surgeon perceptions of expectation discrepancies and how are these reconciled?

METHODS

We recruited participants from the Academic Network of Conservational Hip Outcome Research (ANCHOR Group) in 2016. The ANCHOR Group is a network of surgeons that collaborate in prospectively studying outcomes of both open and arthroscopic hip preservation surgery. Surgeons in the ANCHOR group perform over 600 PAOs annually. Any ANCHOR member with experience performing PAO surgery was invited by email to participate in a semi-structured phone interview. Additionally, participating surgeons were asked for colleague referrals of

experienced PAO surgeons and these referrals were invited to participate as well. There were no cutoffs with regard to surgical volume for participation in the study.

After obtaining surgeon demographics and practice patterns, the interviewer asked a series of questions designed to systematically gather the following data: (i) the clinical and patient factors used to determine patient candidacy for PAO and a rating of importance of these factors on a scale from 1 to 10, with 10 being most important; (ii) the surgeon's expectations for PAO outcomes and the relative ranking of these expectations, with one being the most important; (iii) the surgeon's perceptions of patient expectations for outcomes of PAO and (iv) the surgeon's perceptions of discrepancies between surgeon and patient expectations and approaches for reconciling these discrepancies. Surgeon interviews were audio recorded with the permission of the surgeon and detailed, written notes were recorded by the interviewer. Interviews lasted ~30 min.

An open-ended interview structure was pursued in order to collect data on the range of perspectives among experienced PAO surgeons. Whereas approaches such as the Delphi method or the nominal group technique can be used to develop consensus among a group of experts, we chose an approach that would allow for inclusion of the entire breadth of experience instead of only achieving consensus [19]. Consensus can still be assessed, however, by comparing the responses of the surgeons.

Because this exploratory project aimed to grow our understanding of surgeon expectations and consultation practices around PAO, we tallied the frequency with which each patient selection factor, surgeon expectation, patient expectation and method to resolve discordant expectations was mentioned. Additionally, the mean importance ratings/rankings for each patient selection factor and surgeon expectation were calculated. Throughout the analysis, interviewer notes and surgeon interview audio recordings were reviewed as needed to clarify data.

RESULTS

Twelve surgeons participated in the study, including 77% of ANCHOR surgeons that perform PAO surgery. Surgeon characteristics are listed in Table I. The mean surgeon age was 50.4 years (SD = 9.1 years). All were male. The surgeon group had a mean of 15.1 years (SD = 6.6 years) of experience performing PAOs with a mean of 53.5 (SD = 35.1) PAOs performed per year.

The factors mentioned by surgeons in determining patient candidacy for PAO are presented in Table II, along with descriptors and importance rating on a scale from 1 (minimally important) to 10 (extremely important). Surgeons most often mentioned radiographic findings

Table II Surgeon views of important variables in patient selection for PAO

| <i>Variable</i> | <i>N</i> | <i>Descriptors (N) [SD]</i> | <i>Rating</i> | <i>Notable comments</i> |
|-----------------------------------|----------|---|---------------|---|
| Radiographic findings | 12 | LCEA (9): <21.8° [2.2°] ACEA (7): <21.3° [2.1°] Acetabular index (6): >10° [0°] Abnormal acetabular version (7) Congruency (4) Low volume socket (3) Von Rosen view (2) Subluxation (3) Small sourcil (1) | 9.3 (1.1) | One surgeon thought LCEA and ACEA are 'obsolete' and emphasized importance of size and orientation of sourcil |
| Arthritis | 12 | Tonnis grade (6): <2 [0] No joint space narrowing (5) No cysts/osteophytes (4) No full-thickness loss on MR (3) No edema on MRI (2) Increased leniency if young (2) | 8.8 (1.1) | |
| Age | 11 | Ideal if less than (9): 35 years [6.6] Concern if more than (3): 36.7 years [2.9] | 6.2 (1.6) | One surgeon focused only on 'physiologic age' |
| Symptoms | 10 | Location (7): groin, lateral Activity related (7) Impacts QoL (2) Associated with fatiguing (2) | 9.2 (1.0) | |
| MRI | 8 | | 7.3 (1.8) | |
| BMI | 6 | Ideal if less than (5): 32 [2.4] | 6.2 (1.9) | One surgeon noted that he will allow a higher BMI in the case of severe dysplasia |
| Response to conservative measures | 6 | CSI useful for borderline cases (4) Physical therapy (2) Activity modification (2) NSAIDs (2) | 7.3 (2.3) | One surgeon noted that he trials conservative measures for 3–6 months prior to consideration of surgery |
| Mental health/narcotic usage | 4 | | 7 (1.4) | |

(continued)

Table II. (continued)

| Variable | N | Descriptors (N) [SD] | Rating | Notable comments |
|-----------------------|---|---------------------------------------|-----------|---|
| Range of motion | 4 | | 7.5 (2.1) | |
| CT | 4 | | 6.8 (2.4) | |
| Prior operations | 3 | | 6.3 (1.5) | |
| Patient expectations | 3 | | 8.3 (1.5) | |
| Soft tissue laxity | 2 | | 5 (0) | One surgeon noted that laxity can tip the scales towards surgery in a borderline case |
| Medical comorbidities | 2 | Absence of inflammatory arthritis (2) | 7.5 (0.7) | |
| Clinical exam | 2 | | 7 (0) | |
| Physical condition | 1 | | 8 (n/a) | |

PAO, periacetabular osteotomy; LCEA, lateral center-edge angle; ACEA, anterior center-edge angle; QoL, quality of life; MR, magnetic resonance; MRI, magnetic resonance imaging; BMI, body mass index; NSAID, non-steroidal anti-inflammatory drug; CSI, corticosteroid injection.

($n = 12$, 100%) and gave radiographic findings the highest mean importance rating of 9.3 ± 1.1 . The majority ($n = 9$, 75%) of surgeons mentioned center-edge angles, although one surgeon considered these measurements obsolete. Twelve surgeons (100%) mentioned arthritis with a mean importance ranking of 8.8 ± 1.1 and associated descriptors of Tönnis grade, joint space narrowing, cysts and osteophytes. Eleven surgeons (92%) mentioned age, although this factor was given a mean importance rating of only 6.2 ± 1.6 . One surgeon felt that age was a surrogate marker for health of the articular cartilage. Ten surgeons (83%) cited symptoms, which had a mean importance rating of 9.2 ± 1.0 . Notably, only three surgeons (25%) mentioned patient expectations, although those that mentioned it gave this factor a mean importance rating of 8.3 ± 1.5 .

Factors, descriptors and rankings (with one being the most important) related to surgeon expectations for PAO are listed in Table III. Pain reduction was mentioned by 11 surgeons (92%) with the second highest mean ranking of 1.4 ± 0.8 . Joint preservation was mentioned by nine surgeons (75%) with a mean ranking of 3 ± 1.3 ; of the three surgeons who gave an expected duration of survivorship, the mean was 9.5 ± 0.9 years. Seven surgeons (58%)

mentioned function with activities of daily living (ADLs) with mean ranking 1.9 ± 1.1 , and the majority specified that ADLs should be associated with no or only minimal pain. Return to desired activities was mentioned by seven surgeons (58%) with mean ranking of 2.1 ± 1.1 . The highest ranked factor was patient satisfaction, which was ranked at 1.3 ± 0.8 by 50% of surgeons.

Surgeon perceptions of patient expectations for PAO are presented in Table IV. Eleven surgeons (92%) mentioned the patient expectation of pain reduction, with a majority reporting that patients expect complete resolution of pain. Eleven surgeons (92%) mentioned the patient expectation of return to desired activities, with a majority reporting that patients expect no limitations. The patient expectation of improved function with ADLs was mentioned by six surgeons (50%); again, a majority noted that patients expect no limitations. Only five surgeons (42%) mentioned the patient expectation of joint preservation, and two surgeons (16%) noted that patients care least about joint preservation. Fifty-eight percentage of surgeons felt that surgeon and patient expectations align most of the time; 42% felt they align some of the time. Of those that felt expectations align most of the time, two surgeons felt

Table III. Surgeon expectations for results of PAO

| Variable | N | Descriptors (N) [SD] | Ranking | Notable comments |
|------------------------------|----|---|-----------|---|
| Pain reduction | 11 | Minimal with ADLs (3) Use PROs to assess (3) Depends on pre-op pain (2) | 1.4 (0.8) | One surgeon felt that the expectation for pain reduction is worse in the case of prior hip surgery |
| Joint preservation | 9 | Survivorship (3): 9.5 years [0.9] | 3 (1.3) | One surgeon noted the expectation for joint preservation depends on pre-operative status of the cartilage |
| Function with ADLs | 7 | With no/minimal pain (4) | 1.9 (1.1) | |
| Return to desired activities | 7 | Expect low impact activities (2) Intensity depends on patient (4) | 2.1 (1.1) | One surgeon noted that high impact activities may be accompanied by pain |
| Patient satisfaction | 6 | In retrospect, would patient choose PAO (4) | 1.3 (0.8) | |
| Avoidance of complications | 3 | | 2.3 (0.6) | |
| Radiographic correction | 3 | | 3 (1) | |
| Lack of impingement | 1 | | 5 (n/a) | |
| Improved QoL | 1 | | 2 (n/a) | |

PAO, periacetabular osteotomy; PRO, patient reported outcome; ADLs, activities of daily living; QoL, Quality of Life.

that patient expectations were higher, and two surgeons felt that expectations do align following discussion.

Surgeons noted the most commonly encountered expectation discrepancies include a desire to return to unrestricted activities (cited by $n=8$, 67%) and a desire for complete pain relief (cited by $n=4$, 33%). One surgeon mentioned that a commonly encountered expectation discrepancy is future arthritis, noting that some patients view arthroplasty as an ‘easy fallback’ option. Surgeons noted the most difficult discrepancies to resolve are patient desire for a 100% normal hip (cited by $n=6$, 50%) and patient desire for a higher activity level (cited by $n=4$, 33%); two surgeons (16%) felt that all discrepancies get resolved.

Strategies employed by surgeons to resolve expectation discrepancies are listed in Table V. The most commonly mentioned approach was detailed discussion, indicated by 100% of surgeons. Approaches to this discussion were variable. One surgeon reported drawing a line from 0 to 100 to represent hip function, and placing marks at the current and expected postoperative status of the patient’s hip. One surgeon reported discussing data from his patient registry, including the percentage of patients that achieve a minimally clinically important difference, the percentage that achieve good/excellent outcomes, and the percentage that

achieve any improvement. One surgeon reported utilizing ‘ridiculous transparency’ with regard to expectations and potential complications. One surgeon reported intentionally ‘underpromising’ results in discussion. Several surgeons reported focusing on pain relief and functional activities as goals of surgery, in contrast to high-level activities. Nine of 12 surgeons (75%) felt that a tool to assess patient expectations prior to surgical consultation would be useful. Of these, six surgeons felt such a tool would be helpful to tailor the preoperative discussion, and three surgeons felt it would be helpful to reduce expectation discrepancies. Of the three surgeons that felt the tool would not be useful, two stated that they prefer to elicit patient expectations themselves and one stated that it would be useful only in rare circumstances of very unusual patient expectations.

DISCUSSION

Healthcare decisions that involve consideration of risks and benefits in the absence of strict guidelines are known as ‘preference sensitive’. In several surgical domains, including orthopedic surgery, there has been prioritization of shared decision making between surgeon and patient. Shared decision making implies that the patient is well-informed of risks, benefits and expected outcomes and is

Table IV. Surgeon perceptions of patient expectations

| Variable | N | Descriptors (N) | Notable comments |
|--------------------------------|----|--------------------------------|---|
| Pain reduction | 11 | Expect complete resolution (6) | One surgeon felt that patients have low expectations from reading stories on internet |
| Return to desired activities | 11 | Expect no limitations (6) | |
| Function with ADLs | 6 | Expect no limitations (4) | |
| Joint preservation | 5 | | Two surgeons felt that patients care least about joint preservation |
| Absence of mechanical symptoms | 2 | Complete absence (2) | |
| Avoidance of complications | 1 | | |
| Improved QoL | 1 | | |

ADLs, activities of daily living; QoL, quality of life.

Table V. Surgeon approaches to resolving expectation discrepancies

| Variable | N | Comments |
|-------------------------------------|----|---|
| Detailed discussion with surgeon | 12 | Seven surgeons emphasize that PAO will not produce a 'normal hip'. One surgeon utilizes a PAO-specific consent form during discussion |
| Video | 2 | One surgeon shows hip arthroscopy videos One surgeon uses video from International Hip Dysplasia Institute |
| Discussion with prior patients | 2 | One surgeon noted this to be universally helpful when patients agree to it |
| Literature | 2 | |
| Websites | 1 | |
| Physical model of PAO | 1 | |
| Review data from surgeon's practice | 1 | |

PAO, periacetabular osteotomy.

empowered to act in accordance with his or her preferences [20, 21]. Policy-makers have developed reimbursement schemes that incentivize shared decision making in this manner [18]. As a step towards characterizing the decision-making process for PAO patients, we sought to assess surgeon expectations and to characterize their experiences with expectation discrepancies and strategies for handling discrepancies when they arise.

The most striking finding is that only 3 of 12 surgeons (25%) mentioned patient expectations as a factor in determining patient candidacy for PAO. This finding is especially notable in light of the surgeon perception of discordance between patient and surgeon expectations for PAO outcomes. This dynamic is corroborated by a study of decision

making in lower extremity arthroplasty, in which Bozic *et al.* reported that surgeons ranked 'patient values and preferences' among the least important factors that influence their recommendations; only 14% of surgeons reported directly soliciting patients' expectations for outcomes [20]. While all PAO surgeons likely consider patient expectations to some degree, they may prioritize expectations below other factors such as established criteria for patient selection [22] or known risk factors for poor outcomes [3–5].

Surgeons reported that common expectation discrepancies include the patient's expectation for unrestricted return to desired activities as well as a complete absence of pain. In contrast, surgeons described expectations for pain

and function that depended on the patient's level of pre-operative pain, history of prior surgeries and cartilage status and congruency of the hip joint. A similar dynamic was found by Mannion *et al.* in a study of patients undergoing treatment for femoroacetabular impingement in which over 50% of patients had overly optimistic expectations [8]. These expectation differences may reflect discordance in how surgeons and patients define a successful outcome, wherein surgeons focus on pain reduction and functional activities while a patient's focus may be on return to desired activities. This discordance is corroborated by Martin *et al.*'s study of 150 patients with hip-related disorders, which found significant discrepancies between patients and surgeons in ratings of important issues with regard to outcome [23]. Whereas surgeons rated symptoms and functional limitations highly, patients focused more so on sports and recreation outcomes.

All surgeons in this cohort reported commonly using patient discussion to resolve expectation discrepancies. Other less frequently mentioned tools for resolving expectation discrepancies included videos, referral to prior patients, literature, websites and bone models. Given that the mainstay approach for resolving discrepancies was discussion, this may be an ideal target for interventions that aim to align expectations between patient and surgeon. Patient expectations surveys have been developed in relation to several orthopedic procedures including hip arthroscopy [24]. Identification of patient expectations prior to discussion via a survey may allow the surgeon to tailor the discussion to address factors deemed most important by the patient. In this surgeon group, 75% of the surgeons felt that assessing patient expectations prior to consultation would be helpful.

There are several limitations to this analysis. First, the findings described herein are specific to this cohort of surgeons and may not be generalizable to all surgeons that perform PAO. However, our sample did represent a geographically diverse subset of surgeons. Second, the findings represent only surgeons' perceptions of patient expectations, and are not necessarily representative of real patient expectations for those considering PAO. Further investigation of patient expectations is required. Third, there is the potential for introduction of bias during the conduct of the interview and data analysis. We attempted to minimize bias by using an interview guide created by experienced qualitative researchers and following their guidelines for data analysis. Additionally, frequent consultation with audio recordings of the interviews were employed to attempt to minimize bias and recall error. Finally, our findings come from a small sample of surgeons, thus preventing us from conducting statistical analyses of results. However, because

we aimed to explore surgeons' views of PAO decision making to guide the development of future decision-making tools, the methods and sample size utilized are appropriate. Future work will test these preliminary findings in a larger sample of surgeons.

In sum, a sample of experienced PAO surgeons reported that the most important factors in determining patient candidacy for PAO are symptoms, radiographic findings, absence of arthritis and age. The most important surgeon expectations were pain relief, joint preservation and improved function with ADLs and desired activities. Surgeons felt that patient expectations of complete pain relief and return to unrestricted activities were misaligned with their own expectations. Tools to better define patient expectations and facilitate shared decision making are needed.

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CONFLICT OF INTEREST STATEMENT

None declared.

REFERENCES

1. Ganz R, Klaue K, Vinh TS *et al.* A new periacetabular osteotomy for the treatment of hip dysplasias. Technique and preliminary results. *Clin Orthop Relat Res* 1988; **232**: 26–36.
2. Clohisy JC, Ackerman J, Baca G *et al.* Patient-reported outcomes of periacetabular osteotomy from the prospective ANCHOR Cohort Study. *J Bone Joint Surg Am* 2017; **99**: 33–41.
3. Hartig-Andreasen C, Troelsen A, Thillemann TM *et al.* What factors predict failure 4 to 12 years after periacetabular osteotomy? *Clin Orthop Relat Res* 2012; **470**: 2978–87.
4. Matheney T, Kim YJ, Zurakowski D *et al.* Intermediate to long-term results following the bernese periacetabular osteotomy and predictors of clinical outcome: surgical technique. *J Bone Joint Surg Am* 2010; **92**(Suppl. 1 Pt 2): 115–29.
5. Clohisy JC, Schutz AL, St John L *et al.* Periacetabular osteotomy: a systematic literature review. *Clin Orthop Relat Res* 2009; **467**: 2041–52.
6. Millis MB, Kain M, Sierra R *et al.* Periacetabular osteotomy for acetabular dysplasia in patients older than 40 years: a preliminary study. *Clin Orthop Relat Res* 2009; **467**: 2228–34.
7. Steppacher SD, Tannast M, Ganz R *et al.* Mean 20-year followup of Bernese periacetabular osteotomy. *Clin Orthop Relat Res* 2008; **466**: 1633–44.
8. Mannion AF, Impellizzeri FM, Naal FD *et al.* Fulfilment of patient-rated expectations predicts the outcome of surgery for femoroacetabular impingement. *Osteoarthritis Cartilage* 2013; **21**: 44–50.

9. Mancuso CA, Jout J, Salvati EA *et al.* Fulfillment of patients' expectations for total hip arthroplasty. *J Bone Joint Surg Am* 2009; **91**: 2073–8.
10. Mahomed NN, Liang MH, Cook EF *et al.* The importance of patient expectations in predicting functional outcomes after total joint arthroplasty. *J Rheumatol* 2002; **29**: 1273–9.
11. Jain D, Bendich I, Nguyen LL *et al.* Do patient expectations influence patient-reported outcomes and satisfaction in total hip arthroplasty? A prospective, multicenter study. *J Arthroplasty* 2017; **32**(11): 3322–7.
12. Feucht MJ, Cotic M, Saier T *et al.* Patient expectations of primary and revision anterior cruciate ligament reconstruction. *Knee Surg Sports Traumatol Arthrosc* 2016; **24**: 201–7.
13. Palazzo C, Jourdan C, Descamps S *et al.* Determinants of satisfaction 1 year after total hip arthroplasty: the role of expectations fulfillment. *BMC Musculoskelet Disord* 2014; **15**: 53.
14. Tilbury C, Haanstra TM, Leichtenberg CS *et al.* Unfulfilled expectations after total hip and knee arthroplasty surgery: there is a need for better preoperative patient information and education. *J Arthroplasty* 2016; **31**: 2139–45.
15. Ross CK, Frommelt G, Hazelwood L *et al.* The role of expectations in patient satisfaction with medical care. *J Health Care Mark* 1987; **7**: 16–26.
16. Noble PC, Fuller-Lafreniere S, Meftah M *et al.* Challenges in outcome measurement: discrepancies between patient and provider definitions of success. *Clin Orthop Relat Res* 2013; **471**: 3437–45.
17. Mancuso CA, Graziano S, Briskie LM *et al.* Randomized trials to modify patients' preoperative expectations of hip and knee arthroplasties. *Clin Orthop Relat Res* 2008; **466**: 424–31.
18. Ibrahim SA. Decision aids and elective joint replacement—how knowledge affects utilization. *N Engl J Med* 2017; **376**: 2509–11.
19. Jones J, Hunter D. Consensus methods for medical and health services research. *BMJ* 1995; **311**: 376–80.
20. Bozic KJ, Chenok KE, Schindel J *et al.* Patient, surgeon, and healthcare purchaser views on the use of decision and communication aids in orthopaedic surgery: a mixed methods study. *BMC Health Serv Res* 2014; **14**: 366.
21. Sepucha KR, Fowler FJ Jr, Mulley AG Jr. Policy support for patient-centered care: the need for measurable improvements in decision quality. *Health Aff (Millwood)* 2004; Suppl Variation: VAR54–62.
22. Tonnis D. *Congenital Dysplasia and Dislocation of the Hip in Children and Adults*. New York, NY: Springer, 1987.
23. Martin RL, Mohtadi NG, Safrian MR *et al.* Differences in physician and patient ratings of items used to assess hip disorders. *Am J Sports Med* 2009; **37**: 1508–12.
24. Mancuso CA, Wentzel CH, Ghomrawi HMK *et al.* Hip preservation surgery expectations survey: a new method to measure patients' preoperative expectations. *Arthroscopy* 2017; **33**: 959–68.