Standardizing the Diagnostic Evaluation of Nonarthritic Hip Pain Through the Delphi Method

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Background: Femoroacetabular impingement and acetabular dysplasia have gained increased attention as nonarthritic sources of pain and dysfunction in young, active patients. To date, no standardized approach to the diagnostic evaluation of nonarthritic hip pain has been identified, as previous work has focused on the diagnostic evaluation and management of patients with femoroacetabular impingement undergoing hip arthroscopy.

Purpose: To explore the standard diagnostic evaluation practice of experts in the field of hip preservation surgery and combine their expertise through the Delphi method to form a standardized approach to the diagnostic evaluation of patients with nonarthritic hip pain.

Study Design: Consensus statement.

Methods: An expert panel made up of 18 orthopaedic surgeons with extensive experience in the treatment of nonarthritic hip disorders participated in this Delphi study. The Delphi panelists were presented with 4 clinical vignettes representing a spectrum of patients with nonarthritic hip pain. Three iterative survey rounds were presented to the panelists based on these clinical vignettes, and a 3-step classic Delphi method was used to establish consensus techniques in the diagnostic evaluation of nonarthritic hip pain.

Results: Total (100%) participation was gained, with all 18 experts completing all 3 Delphi survey rounds. Consensus ($\geq$75% support) was achieved for some, if not all, vignettes for each of the following diagnostic domains: historical features, physical examination, radiographic sequences, radiographic interpretation, cross-sectional imaging, and ancillary diagnostics.

Conclusion: In this Delphi study, we identified standardized diagnostic treatment approaches as derived from expert opinion for patients with nonarthritic hip pathomorphologies.

Keywords: hip/pelvis/thigh; hip arthroscopy; femoroacetabular impingement; acetabular dysplasia

Femoroacetabular impingement (FAI) and acetabular dysplasia (AD) have gained increased attention as nonarthritic sources of pain and dysfunction in young, active patients.[1,9,14,16] One patient population with a lateral center-edge angle (LCEA) from 18° to 25°, labeled as mild or borderline dysplastic hips, has been identified with morphologic features that may predispose them to either hip impingement or dysplasia.[2,5,7,8,11,15] Accurate identification of the correct diagnosis of nonarthritic hip pain is critical toward choosing the optimal treatment method and, potentially, surgical approach.

Accurately diagnosing the source of nonarthritic hip pain is challenging, especially in cases with borderline acetabular coverage.[3,8,12,13] To date, no standardized approach to the diagnostic evaluation of nonarthritic hip pain has been identified, as previous work has focused on the diagnostic evaluation and management of patients with FAI undergoing hip arthroscopy.[6] Without a standardized method to evaluate these patients, the same patient may be evaluated and diagnosed differently between clinicians. With this lack of standardization, it is difficult to accurately compare treatment outcomes between clinicians, which ultimately hinders the field of hip preservation from making progress in the optimization of patient care.

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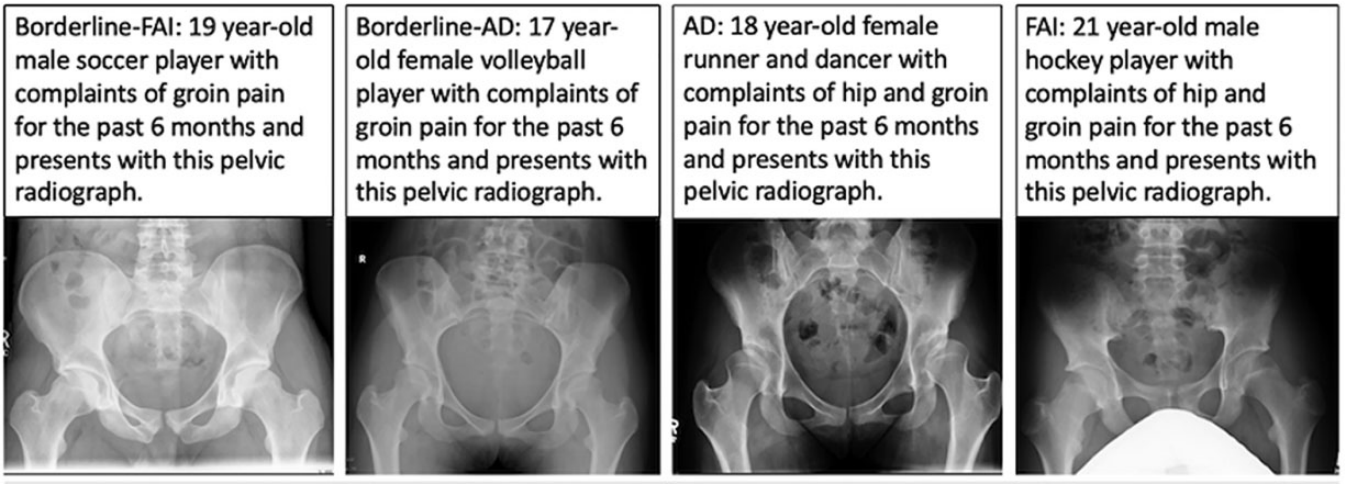

Figure 1. Four clinical case vignettes of nonarthritic hip pain, including a brief history and an anteroposterior pelvic radiograph. AD, acetabular dysplasia; FAI, femoroacetabular impingement.

Our goal was to explore the standard diagnostic evaluation practice of experts in the field of hip preservation surgery for patients with a variety of hip morphologies. We surveyed hip surgeons with expertise in sports medicine/arthroscopy and open hip preserving surgery, with both adult and pediatric training backgrounds. We then sought to combine their expertise through the Delphi method to form a standardized approach to the diagnostic evaluation of patients with nonarthritic hip pain. We hypothesized that these experts would provide variable diagnostic approaches to the case vignettes in the initial rounds but gradually incorporate the approaches of their peers to develop a consensus method in later rounds.

METHODS

Delphi Panel

An expert panel made up of 18 orthopaedic surgeons with extensive experience and dedication to the treatment of nonarthritic hip disorders participated in this Delphi study. They were purposefully sampled from geographically diverse institutions across North America. Participants were selected based on multiple criteria, including (1) extensive research in hip preservation surgery (>10 hip-related publications indexed in the National Library of Medicine) and (2) clinical expertise in hip preservation surgeries, either arthroscopic, open, or both (>50 annual open and/or arthroscopic hip preservation surgeries). An effort was made to select specialists from diverse surgical backgrounds, including pediatric orthopaedics, orthopaedic sports medicine, and adult reconstruction. All members consented to participate, and participants were blinded to each other throughout the entire study. Blinding was gained by request; a clearly stated condition of participation was that participants should not attempt to identify other participants. Responses were stripped of identifiers before analysis.

Delphi Structure and Data Collection

A 3-round classic Delphi method was used to establish consensus techniques in the diagnostic evaluation of nonarthritic hip pain.[10] The classic Delphi method is based on participant questionnaires; this allows more careful consideration of complex topics and the development of thoughtful responses. Each of the 3 rounds involved a questionnaire that was sent out. The first round solicited initial responses and supporting statements, the second and third rounds presented first-round results and reconsideration (if there was disagreement). Three rounds were used to allow for consensus to be built or to fully understand the points of contention that would not allow for agreement. Consensus was defined a priori as $\geq$75%, relatively low per standard Delphi methods, in order to account for the expected levels of disagreement within our highly diversified group of expert panelists. Our study had a dual objective of gaining consensus and, of equal importance, understanding areas where consensus could not be reached and reasons for disagreement.

Delphi panelists were presented with 4 clinical vignettes representing a spectrum of patients with nonarthritic hip pain (Figure 1). Two vignettes included an anteroposterior (AP) pelvic radiographs showing hips that fell within the "mild" or "borderline" acetabular coverage zone (LCEA, 18°-25°). These borderline hips, borderline-FAI (B-FAI) and borderline-AD (B-AD), had imaging features of impinging (cam-type proximal femur, acetabular crossover) and unstable (low AP wall indices) hips, respectively. Two vignettes included AP pelvic radiographs showing hips that fell outside the mild/borderline zone, with 1 showing features consistent with impingement (FAI-LCEA, >35°; cam-type proximal femur) and the other showing features consistent with AD (AD-LCEA, <10°). Vignette age was kept in the adolescent and young adult (20s) range, as we were including a diverse group of hip specialists, including pediatric orthopaedists. By choosing this age group, we made the vignettes applicable to all Delphi clinical practices. By

focusing on young patients, we also sought to limit the concern of arthritic joint disease in these patients, which is more prevalent with increasing age. Further, a broader patient base (eg, all age groups) would have weakened the study with too inclusive of a question, making the questionnaire overly burdensome and perhaps affecting participation.

Three iterative survey rounds were presented to the panelists based on these clinical vignettes. Questionnaires for rounds 1 to 3 were distributed online via an emailed link. Individual follow-up prompts were used to gain responses when participants did not respond to the standard email prompts. Delphi participants remained anonymous to all but the study coordinators, and responses were deidentified during thematic content analysis. For each round of questionnaires, thematic content analysis of the participants' responses was completed by 2 study team members (M.P.M., J.D.W.). Any disagreements were resolved by a third team member (E.N.N.).

In round 1, panelists were presented with 4 vignettes and, for each vignette, 6 open-ended questions regarding their clinical practice habits across 6 aspects of clinical diagnostics:

1. What important history questions would you ask this patient?
2. What physical examination tests would you perform on this patient?
3. Which radiographic views, if applicable, would you obtain for their evaluation?
4. What radiographic measures, if any, are important to quantify based on this imaging evaluation?
5. What ancillary imaging, if applicable, would you obtain in their evaluation?
6. What other diagnostics, if applicable, would you order or perform in their evaluation?

Experts were prompted to provide free-text responses to each.

The experts provided a detailed description of their routine evaluation of the patients described in the vignettes. Responses were collected and coded for thematic content, and modal responses were identified by those reported by $\geq$50% of expert panelists. A second tier of responses was also recorded with a response rate $\geq$25%. Delphi participants were given the option to verify their coded responses after the first-round survey.

In round 2, the Delphi panelists were presented with the same 4 vignettes and 6 questions as in round 1. They were also presented with the modal ($\geq$50%) and second tier ($\geq$25%) responses provided from the round 1 surveys. The panelists were asked to "agree" or "disagree" with the modal response for each vignette/question. When the panelists did not agree with the modal response, they were prompted to provide additional responses and/or subtract from the current modal response. For cases in which panelists sought to provide additional components to the modal response, they were presented with the second-tier responses as options from which to choose or were permitted free-text additions. Again, the resulting responses were coded for thematic content and new modal responses were generated.

In round 3, respondents were again presented with the same vignettes and question categories as well as modal and second-tier responses from round 2. Analysis of the third-round data presented options for which consensus had been gained as well as rationale for disagreement.

TABLE 1
Delphi Participants and Practice Details (Location and Scope)

Delphi Participant No.	Scope of Practice	Region of Practice
1	Sports medicine	Mountain West
2	Sports medicine	Midwest
3	Adult reconstruction	East Coast
4	Adult reconstruction	Midwest
5	Pediatrics	East Coast
6	Sports medicine	Midwest
7	Adult reconstruction	West Coast
8	Pediatrics	East Coast
9	Sports medicine	Midwest
10	Adult reconstruction	Mountain West
11	Pediatrics	South
12	Sports medicine	West Coast
13	Pediatrics	East Coast
14	Adult reconstruction	Midwest
15	Adult reconstruction	Midwest
16	Pediatrics	South
17	Sports medicine	East Coast
18	Pediatrics	Midwest

RESULTS

Delphi Panelists

Table 1 lists the region and scope of practice of the 18 expert panelists. Total (100%) participation was gained, with all 18 experts completing all 3 Delphi survey rounds.

Consensus and Disagreement

Tables 2 to 7 display the levels of agreement and consensus achieved at the completion of round 3. Agreement was defined as group acceptance ($\geq$75%) of an individual component of the modal response, while consensus was defined as acceptance ($\geq$75%) of the entire modal response set for that vignette. Response components are presented individually for each vignette, but responses reaching agreement across all vignettes are noted. Sources of disagreement are also noted.

Historical Factors

All vignettes except B-AD achieved the consensus threshold for historical features to be scrutinized during patient evaluation (Table 2). The commonly agreed-upon topics for each vignette included pain severity and character, pain location, aggravating and alleviating factors, and previous

TABLE 2
Delphi Results for Patient History Evaluation[a]

	Modal Response	Agreement (%)	Consensus (%)	Sources of Disagreement
B-FAI	Pain character/severity	100	78	Functional limitations
	Location of pain	100		
	Aggravating/alleviating factors	100		
	Previous treatments	100		
	Sports-related pain	100		
B-AD	Pain character/severity	100	72	Functional limitations
	Location of pain	100		
	Aggravating/alleviating factors	100		
	Previous treatments	100		
AD	Pain character/severity	100	78	Functional limitations
	Aggravating/alleviating factors	100		
	Location of pain	100		
	Previous treatments	100		
FAI	Pain character/severity	100	78	Functional limitations
	Location of pain	100		
	Aggravating/alleviating factors	100		
	Previous treatments	100		
	Sports-related pain	100		

[a]AD, acetabular dysplasia; B, borderline; FAI, femoroacetabular impingement.

treatments. Interestingly, vignettes with AP pelvic radiograph suggestion of an impingement process (FAI and B-FAI) also included an agreed-upon topic of sports-related pain, while dysplastic vignettes (AD and B-AD) did not include this topic.

Physical Examination Factors

Responses to all vignettes reached the agreement threshold on a common list of examination tests (Table 3): flexion range of motion, flexion internal/external rotation, flexion adduction–internal rotation test, flexion abduction–external rotation test, prone rotation, and gait. Additional tests of anterior apprehension/instability and laxity/Beighton scoring were a source of controversy across the vignettes. These tests were included in the final responses for the AD and B-AD vignettes but were not included in the FAI and B-FAI final responses. Consensus was achieved in the dysplastic vignettes (B-AD and AD) with the inclusion of anterior apprehension/instability testing and laxity/Beighton scoring. Both FAI vignettes had a minority of expert support for laxity/Beighton and instability testing as well, yet they did not meet the threshold for inclusion in the final response. Panelists supporting laxity/Beighton and apprehension/instability testing chose to reject the final responses in the FAI vignettes, thus preventing the consensus threshold from being achieved.

Radiographic Sequences

All vignettes generated a consensus radiographic sequence to include standing AP pelvis, 45° Dunn lateral, and false-profile images (Table 4). The AD vignette also included a Von Rosen, or abduction/internal rotation, view in the final consensus response. In the initial survey responses, both supine and standing AP pelvic radiographs were endorsed by several experts. A small majority (52%) leaned toward the standing AP view, and in subsequent rounds, the standing AP view gained increased support as experts shifted away from supine films. Ultimately, the standing film was included in the consensus sequence for all vignettes.

Radiographic Measurements

There was less success at achieving consensus with radiographic interpretation (Table 5). Responses to all 4 vignettes achieved near-unanimous agreement with the measurements of LCEA, Tönnis roof index, anterior center-edge angle, and femoral alpha angle. The radiographic features of acetabular retroversion were sources of controversy, with multiple experts endorsing their inclusion. Their lack of inclusion led some experts to reject the modal response and prevented consensus development. Only the B-FAI vignette achieved the consensus threshold, with additional measures of acetabular retroversion (crossover and posterior wall signs) being included in the consensus response.

Cross-sectional Imaging

Cross-sectional imaging provided the greatest source of controversy for experts, as only the FAI vignette achieved consensus (Table 6). In all vignettes, experts reached the agreement threshold on magnetic resonance (MR) arthrograms and computed tomography (CT) scans (with 3-dimensional reconstructions). In initial survey rounds, responses were nearly split between the inclusion of an MR imaging (MRI; 49%) or MR arthrogram (51%), with a slight preference for arthrogram. Over

TABLE 3
Delphi Results for Physical Examination[a]

	Modal Response	Agreement (%)	Consensus (%)	Sources of Disagreement
B-FAI	ER/IR ROM in flexion	100	50	Beighton criteria, abductor/hip flexor strength evaluation; neurologic examination
	Flexion ROM	100		
	Impingement/FADIR Test	100		
	FABER	100		
	Gait	100		
	Prone ROM	89		
B-AD	ER/IR ROM in flexion	100	78	None
	Flexion ROM	100		
	Impingement/FADIR test	100		
	Anterior instability/apprehension test	100		
	Gait	100		
	FABER	100		
	Laxity/Beighton score	100		
	Prone ROM	100		
AD	ER/IR ROM in flexion	100	83	Abduction strength
	Flexion ROM	100		
	Impingement/FADIR test	100		
	Anterior instability/apprehension test	100		
	Gait	100		
	FABER	100		
	Laxity/Beighton score	100		
	Prone ROM	100		
FAI	ER/IR ROM in flexion	100	61	Beighton criteria
	Flexion ROM	100		
	Impingement/FADIR test	100		
	Gait	100		
	Prone ROM	100		
	FABER	100		

[a]AD, acetabular dysplasia; B, borderline; ER, external rotation; FABER, flexion abduction–external rotation; FADIR, flexion adduction–internal rotation; FAI, femoroacetabular impingement; IR, internal rotation; ROM, range of motion.

TABLE 4
Delphi Results for Radiographic Imaging Views[a]

	Modal Response	Agreement (%)	Consensus (%)	Sources of Disagreement
B-FAI	AP (standing)	89	83	AP (supine)
	45° Dunn lateral	100		
	False profile	100		
B-AD	AP (standing)	89	78	AP (supine); Von Rosen (abduction view)
	45° Dunn lateral	100		
	False profile	100		
AD	AP (standing)	94	78	
	45° Dunn lateral	100		
	False profile	100		
	Von Rosen	89		
FAI	AP (standing)	89	83	AP (supine)
	45° Dunn lateral l	100		
	False profile	100		

[a]AD, acetabular dysplasia; AP, anteroposterior; B, borderline; FAI, femoroacetabular impingement.

subsequent rounds, the majority of experts shifted their support to MR arthrogram, while few maintained specific support for MRI. Imaging of the distal femur (for calculation of the femoral version) in CT or MRI was a source of controversy. Distal femoral imaging was included in the final response for the FAI vignette, and consensus was achieved. Distal femoral imaging was not included in the final response for the other vignettes, all of which failed to achieve consensus because of its omission.

TABLE 5
Delphi Results for Radiographic Interpretation[a]

	Modal Response	Agreement (%)	Consensus (%)	Sources of Disagreement
B-FAI	LCEA	100	83	
	Tönnis roof index	100		
	ACEA	94		
	Femoral alpha angle	100		
	Posterior wall sign	100		
	Crossover sign	100		
B-AD	LCEA	100	61	Shenton line; crossover sign; posterior wall sign; neck-shaft angle
	Tönnis roof index	100		
	ACEA	100		
	Femoral alpha angle	100		
AD	LCEA	100	67	Shenton line; crossover sign; posterior wall sign; neck-shaft angle
	Tönnis roof index	100		
	ACEA	100		
	Femoral alpha angle	100		
FAI	LCEA	100	72	Crossover sign; posterior wall sign
	Tönnis roof index	100		
	ACEA	94		
	Femoral alpha angle	100		

[a]ACEA, anterior center-edge angle; AD, acetabular dysplasia; B, borderline; FAI, femoroacetabular impingement; LCEA, lateral center-edge angle.

TABLE 6
Delphi Results for Cross-sectional Imaging Evaluation[a]

	Modal Response	Agreement (%)	Consensus (%)	Sources of Disagreement
B-FAI	MRA	94	61	Distal femur (version); MRI (high resolution)
	CT/3D CT	89		
B-AD	MRA	94	44	Distal femur (version)
	CT/3D CT	78		
AD	MRA	94	56	Distal femur (version)
	CT/3D CT	78		
FAI	MRA	94	83	
	CT/3D CT	94		
	Distal femur (version)	89		

[a]3D, 3-dimensional; AD, acetabular dysplasia; B, borderline; CT, computed tomography; FAI, femoroacetabular impingement; MRA, magnetic resonance arthrography; MRI, magnetic resonance imaging.

TABLE 7
Delphi Results for Ancillary Diagnostic Tests[a]

	Modal Response	Agreement (%)	Consensus (%)	Sources of Disagreement
B-FAI	Diagnostic Injection	94	89	
B-AD	Diagnostic Injection	83	72	
AD	None	83	83	Diagnostic injection
FAI	Diagnostic Injection	94	89	

[a]AD, acetabular dysplasia; B, borderline; FAI, femoroacetabular impingement.

Ancillary Diagnostics

Diagnostic injection was the only commonly suggested ancillary study for all vignettes (Table 7). Both FAI vignettes included diagnostic injections in the consensus response. The AD vignette had a few experts advocate for diagnostic injection, but the majority agreed that it was not necessary for diagnostic purposes. The B-AD vignette had several respondents advocate for diagnostic injection, but it failed to meet the threshold for agreement.

DISCUSSION

This Delphi method study represents the first effort to standardize the diagnostic approach to nonarthritic hip pain across a spectrum of diagnoses. Previous work has specifically focused on the diagnosis and management of FAI through hip arthroscopy.[6] Our study represents the expert opinions of 18 specialists from across North America, with varied training backgrounds, including both open and arthroscopic hip preservation techniques. Participation at 100% was achieved for all survey rounds of this study, and consensus was achieved for a number of strategies for the diagnostic evaluation of nonarthritic hip pain. While we presented 4 clinical vignettes to provide a variety of patient backgrounds, the ultimate goal of the study was to develop a standardized approach to the diagnostic evaluation of all patients with nonarthritic hip pain.

Interestingly, while the experts were presented with only age, sex, and an AP pelvic radiograph in the clinical vignettes, these features alone pushed them to establish a diagnostic approach to the patient, as the workup of a patient with FAI-predominant features differed from the workup of a patient with dysplasia-predominant features. In cases with mixed or borderline morphologies, this inherent bias to diagnostic evaluation may be detrimental to accurately diagnosing the cause of hip pain.[8,12]

Patient history and radiographic imaging were the topics with the most consistent consensus responses across vignettes. For history, all vignettes achieved consensus and included the features of pain character/severity, pain location, aggravating and alleviating factors, and previous treatments as the consensus response. The most consistent topic of consensus among experts was the radiographic imaging sequence. For all vignettes, a standardized sequence of standing AP pelvic, 45° Dunn lateral, and false-profile radiographs was agreed upon.

For physical examination, radiographic interpretation, and cross-sectional imaging, consensus was achieved in only a portion of the clinical vignettes. Interestingly, in each of these topics, consensus was reached for the vignettes in which a more expansive diagnostic approach was proposed. Further, the free-text additions to the responses that led to consensus were routinely noted as sources of controversy in other vignettes. In other words, when consensus was not achieved, it was typically because of an insufficiently broad diagnostic approach. No vignettes failed to achieve consensus because experts felt the modal response was too broad.

Table 8 presents the agreement responses (acceptance by ≥75% of the panelists) and most common free-text addition responses not achieving agreement (<75%) across all vignettes. By applying the most expansive consensus response across all vignettes, all common sources of disagreement were resolved. The proposed standardized diagnostic approach to patients with nonarthritic hip pain is presented in the final column. As the additions do not involve additional diagnostic testing (more studies, laboratory tests, etc), this more expansive approach should not significantly alter cost. It must be noted that this proposed standardized diagnostic approach was our interpretation of the vignette data and was not derived directly from panelist responses.

TABLE 8
Summative Delphi Results With Agreement Responses and Topics of Controversy[a]

	B-FAI	B-AD	AD	FAI	All[b]
Patient history					
Pain character/severity	*	*	*	*	*
Location of pain	*	*	*	*	*
Aggravating/alleviating factors	*	*	*	*	*
Previous treatments	*	*	*	*	*
Physical examination					
ER/IR ROM in flexion	*	*	*	*	*
Flexion ROM	*	*	*	*	*
Impingement/FADIR test	*	*	*	*	*
Anterior instability/ apprehension test	#	*	*	#	*
Gait	*	*	*	*	*
FABER test	*	*	*	*	*
Laxity/Beighton score	#	*	*	#	*
Prone ROM	*	*	*	*	*
Radiographic sequence					
AP (standing)	*	*	*	*	*
45° Dunn lateral	*	*	*	*	*
False profile	*	*	*	*	*
Radiographic interpretation					
LCEA	*	*	*	*	*
Tönnis roof index	*	*	*	*	*
ACEA	*	*	*	*	*
Femoral alpha angle	*	*	*	*	*
Posterior wall sign	*	#	#	#	*
Crossover sign	*	#	#	#	*
Cross-sectional imaging					
MRA	*	*	*	*	*
CT/3D CT	*	*	*	*	*
Distal femur (version)	#	#	#	*	*
Ancillary studies					
Diagnostic injection	*	*	#	*	*

[a]3D, 3-dimensional; ACEA, anterior center-edge angle; AD, acetabular dysplasia; AP, anteroposterior; B, borderline; CT, computed tomography; ER, external rotation; FABER, flexion abduction–external rotation; FADIR, flexion adduction–internal rotation; FAI, femoroacetabular impingement; IR, internal rotation; LCEA, lateral center-edge angle; MRA, magnetic resonance arthrography; ROM, range of motion. *, ≥75% agreement; #, topic of controversy.

[b]This column presents our proposed standardized diagnostic pathway for patients with nonarthritic hip pain.

Especially in cases involving borderline acetabular coverage (LCEA, 18°-25°), with a potential mixture of both impingement and instability features, a thorough diagnostic approach is essential to developing a surgical plan. Nepple et al[13] noted that patients with borderline acetabular coverage showed differences in historical features and physical examination findings between patients ultimately diagnosed with impingement versus instability. Numerous authors have noted that radiographic parameters aside from lateral acetabular coverage often differ between patients with hip dysfunction driven by impingement

versus instability and have advocated for a thorough scrutinization of plain radiographs and cross-sectional imaging when evaluating these patients.[3,4,8,13]

Our study adds to the sparse available literature regarding best practices for hip preservation. Lynch et al[6] focused on the preoperative, intraoperative, and postoperative best practices for patients undergoing hip arthroscopy for FAI in a recent multi-institutional Delphi study. They identified a total of 52 consensus recommendations for the management of these patients before, during, and after surgical correction of FAI. The current study adds to this by expanding our patient population to cover both FAI and AD cases, which in tandem cover the vast majority of patients with nonarthritic hip pain. This study focused on the preoperative patient evaluation, and many of our expert consensus statements align closely with those identified by Lynch et al. The primary outcomes of this study included identification of a standardized radiographic sequence (standing AP pelvic, 45° Dunn view, and false-profile views) and inclusion of 2 forms of cross-sectional imaging (MR arthrogram and CT scan) in the workup of nonarthritic hip pain.

Limitations

Several limitations must be noted for this study. First, as no official guidelines exist regarding the diagnostic evaluation of nonarthritic hip pain, we relied on our expert panelists' opinions to generate our initial diagnostic approach. While this technique may introduce bias into resultant modal responses, efforts were made to recruit a diverse group of experts to minimize this effect. Second, we did not present our proposed standardized diagnostic approach (Table 8) to the Delphi panel at the close of the study. While this may have strengthened our final diagnostic approach statement through dialogue, our results were consistent enough to derive a diagnostic approach pathway to use as a foundation for further consensus building. Last, as our clinical vignettes focused on young patients (adolescents and 20s), our results may not be applicable to all age ranges, specifically when consideration of arthritic disease is of greater concern.

Future Directions

Accurately diagnosing the source of nonarthritic hip pain is essential to providing appropriate treatment. Without a standardized method to evaluate these patients, the same patient may be evaluated and diagnosed differently between providers. In this Delphi study, we identified a diagnostic treatment approach applicable to all patients with nonarthritic hip pain, derived from expert opinion. This standardized approach can serve as a framework for the evaluation of nonarthritic hip pain and help improve diagnostic and treatment decision making.

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