Arthroscopic Bone Grafting of Deep Acetabular Cysts: A Retrospective Case Series

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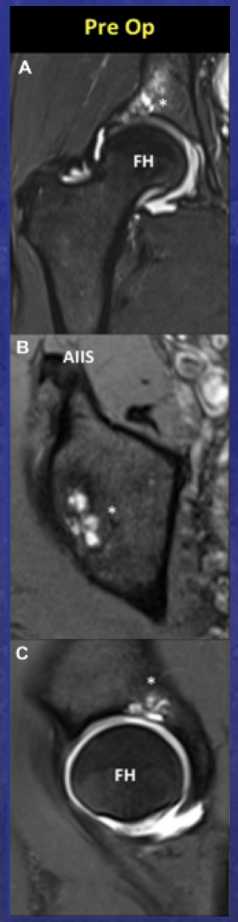
Introduction

- Acetabular intraosseous cysts are frequently encountered in young adults with femoroacetabular impingement (FAI) or dysplasia and are commonly associated with the development of early and advanced arthritis.[1, 2, 3]
- Patients with acetabular cysts demonstrate increased pain, disability, and worse surgical outcomes during arthroscopic procedures.[4, 5]



Preoperative T2 magnetic resonance imaging (MRI) demonstrating acetabular subchondral bone cysts (A) in the weightbearing portion, (B) with a loculated pattern, and (C) with articular cartilage breach

Introduction

- For many surgeons, subchondral cysts pose a relative contraindication for hip preservation surgery, as the presence of an acetabular cyst on MRI has been shown to predict lower success rate and inferior patient-reported outcomes.[6]
- Hartigan et al[7] reported that patients with subchondral cysts undergoing hip arthroscopy converted to total hip arthroplasty in 36% of cases.

Purpose

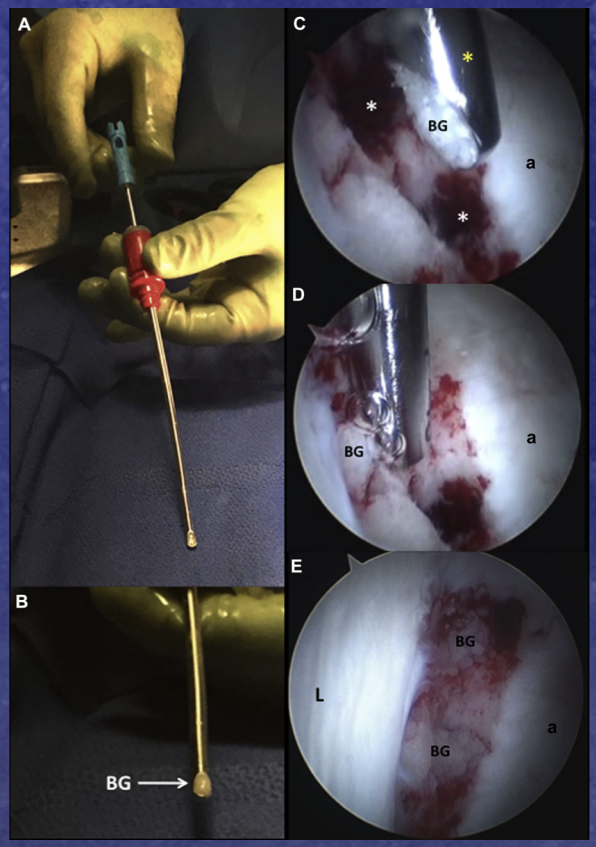
To investigate whether arthroscopic bone grafting of acetabular subchondral cysts during hip preservation surgery is a safe and efficacious treatment option.

Methods

- Retrospective Cohort Study
- Patients having undergone hip arthroscopy between April 2013 and August 2021 with senior author (OMD)
- Study Inclusion Criteria
  - Persistent hip pain and mechanical symptoms refractory to non-operative or operative management lasting > 3 months
  - Presence of acetabular cyst as noted on preoperative MRI and/or CT
- Study Exclusion Criteria
  - Undergoing surgery for the following diagnoses:
    - Slipped Capital Femoral Epiphysis
    - Legg Calves Perthe's Disease
    - Osteochondromatosis
    - Post-dislocation syndrome

Methods

- Surgical Technique
  - Area of suspected intra-articular breach inspected during central compartment evaluation
  - Damaged cartilage excised
  - Curved arthroscopic shaver introduced into the cystic cavity
  - Cyst convents evacuated and bone graft delivered



(A) A curved shaver is disassembled by applying pressure against the sterile back table until the angle of curvature is slightly reduced (B) The outer sheath is loaded with bone graft (BG) (C) A curved shaver sleeve (yellow asterisk) loaded with bone graft is inserted in preparation for bone grafting of the cystic cavities (white asterisks). (D) A curved shaver sleeve (yellow asterisk) is placed with the side-opening of the shaver sleeve facing the cystic cavity to deliver the bone graft. (E) a well-positioned bone graft can be seen within the loculated cystic cavity in the well-contained articular cartilage defect.

(a, acetabulum; L, labrum.)

Methods

- Initial data collected, including presence of acetabular subchondral cysts, reoperation rate, complications, and return to play time, on patients with FAI or hip dysplasia who underwent hip preservation surgery with senior author (OMD) between April 2013 and August 2021
- Patient-reported outcomes (iHOT-12 and NAHS) were collected for 41 patients who underwent arthroscopic acetabular cyst decompression and bone grafting preoperatively and at the following postoperative intervals (6 weeks, 3 months, 6 months, 1 year, 2 years, and latest follow-up (range 1-8 years)
- Minimal Clinically Important Difference (MCID) and Patient Acceptable Symptomatic State (PASS) were calculated for iHOT-12 and NAHS scores via distribution methods and validated score standards to determine the time points at which each was respectively achieved by this cohort

Results

- Preoperative iHOT-12 improved from 38.1 ± 18.0 to 88.8 ± 9.1 at latest follow-up ($p < 0.0001$), and reached statistical significance at 3 months postoperatively
- Similarly, preoperative NAHS improved from 63.26 ± 19.4 to 89.7 ± 12.3 at latest follow up (range, 1-8 years) and reached significance at 3 months postoperatively

MCID was achieved at the 3-month mark for both iHOT-12 (9) and NAHS (9.7). PASS for iHOT-12 (63) was achieved at 3 months postoperatively

N = 41	Preoperative Score	Final Postoperative Score	P-value
iHOT-12	38.1 +/- 18.0	88.8 +/- 19.1	(p<0.0001)
NAHS	63.26 +/- 19.4	89.7 +/- 12.3	(p<0.0001)

Discussion

- Previous studies have described various methods of surgical treatment of acetabular subchondral cysts
  - Field et al[5]: Drill guide placed through the ilium for insertion of synthetic osteochondral plug
  - Alwood et al[1]: Mixed autologous bone marrow aspirate with bone marrow aspirate concentrate and cartilage-derived graft prior to injecting through a hole drilled through the acetabular rim
- These outside-in techniques provide indirect access for cyst lining removal and may result in persistent pain or cyst recurrence
- Our technique utilizes an inside-out technique with a curved delivery device to access the cyst space for delivery of bone graft material.[8]

Conclusions

- The optimal treatment of acetabular cysts addresses both the cyst as well as the offending mechanism – that is, the FAI and/or dysplasia contributing to cartilage damage and subsequent cyst development.
- Our technique produces an optimal outcome for patients with acetabular cysts by directly visualizing the cyst, accessing the cyst through the articular side, and addressing the FAI or dysplasia that is contributing to its development.

Select References

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