Ischiofemoral Impingement and Hamstring Dysfunction After Ischial Tuberosity Apophyseal Fracture Nonunion or Malunion: Surgical Outcomes


Disclosures

• L. Spencer-Gardner MD
  • There are no financial relationships to disclose:

• Asheesh Bedi MD
  • Consultant – Smith and Nephew

• Michael Stuart MD
  • Royalty – Arthrex
  • Consultant – Arthrex
  • Research – Stryker

• Christopher Larson MD
  • Consultant – Smith and Nephew, A3 Surgical
  • Research – Smith and Nephew

• Bryan Kelly MD
  • Consultant – Pivot Medical, A3 Surgical
  • Research – Pivot Medical, Mitek

• Aaron Krych MD.
  • Consultant – Arthrex, Depuy-Mitek
  • Research – Histogenics; Ceterix Orthopedics, Inc.; Arthritis Foundation
Background

• Ischial tuberosity (IT) avulsion fractures are rare variants of proximal hamstring injuries.

• They typically occur between puberty and the age of 25, prior to the fusion of the apophysis with the ischium[1].

• Non-operative treatment has been reported, with some advocating operative treatment if greater than 1-2 cm of displacement exists[2-5].
Background

- In some cases, pain persists in the setting of ischial nonunion or malunion.
- Pain and dysfunction in this setting is likely multifactorial but has not been well described.
- Ischiofemoral impingement (IFI) has been described in the native hip, resulting in pain from abnormal contact between the ischium and the lesser trochanter (LT).
- Recent case reports have described the surgical treatment of IFI in the native hip with good short term results[6,7].
Background

- To our knowledge there are no reports of IFI as sequelae of IT avulsion fracture.
- The purpose of this paper is to introduce the concept of IFI as potential sequelae of ischial apophysis avulsion fracture as demonstrated by dynamic assessment with 3D CT reconstruction modelling.
- We also present the clinical outcomes of the surgical treatment of IFI and proximal hamstring dysfunction in patients with malunion or non-union of an IT avulsion fracture.
Methods

• All patients who underwent surgery for recalcitrant hip and buttock pain in the setting of prior IT avulsion fracture at three tertiary level hip preservation centers were included for this retrospective review.

• Diagnosis of IFI and hamstrings dysfunction was made by preoperative imaging, clinical examination, and diagnostic ultrasound guided injections in selected cases.
Methods

- CT analysis for morphology and dynamic assessment for IFI was completed in a subset of cases.
- Surgical treatment involved sciatic neurolysis, resection of the ischial tuberosity fragment with hamstrings reattachment in all cases.
- Patient reported outcomes scores included the Modified Harris Hip Score (mHHS) and the Hip Outcomes Score (HOS).
Results

• A total of 13 patients met the inclusion criteria.
• Follow up data was collected on 10/13 (77%) patients.
• The mean age at surgery was 18 years (14-28).
• Mean follow up was 2.2 years (1.7-3.5).
## Results

### Patient Reported Outcomes

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<tr>
<th>mHHS</th>
<th>HOS</th>
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<tr>
<td></td>
<td>ADL Score %</td>
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<td>86.8 (72.6-100)</td>
<td>95 (83.8-100)</td>
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<th>Level of Function</th>
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<td>Normal</td>
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Results

• 3D CT Assessment of Morphology and Dynamic Analysis of IFI (n=4).

• All cases demonstrated IFI in extension and ER

• Mean femoral anteversion 9.3 ± 6.5°

• Mean neck-shaft angle 135°

• Mean maximum alpha angle 69±11°

• Mean range of motion
  • Terminal flexion 110°
  • IR in 90 degrees of flexion 26°
  • FADIR 15°
Discussion

• We propose that IFI can occur after ischial apophysis avulsion fractures secondary to narrowing of the ischiofemoral space with displacement of the apophyseal fragment.

• We feel that in patients with apophyseal injuries, addressing the pathoanatomy of the bony displacement of the IT and hamstring dysfunction is best accomplished by restoration of anatomy at the IT and hamstrings insertion, rather than decompression at the LT as has been described in the native hip[6,7].
Conclusions

- Malunion or nonunion following IT apophyseal fracture can lead to IFI and hamstring dysfunction.
- Dynamic CT analysis is confirmatory of IFI and demonstrates a high incidence of concomitant femoroacetabular impingement.
- In select cases, we present a reliable surgical technique to restore anatomy, improve hamstring dysfunction and correct IFI in this setting with good to excellent outcomes in the majority of cases at short term follow up.
References


