Update on Hip Arthroscopy: Thinking Outside of the Box

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Traditional Femoroacetabular Impingement:
CAM Impingement:
Primary Injury to Transition Zone

Rim Impingement:
Primary Injury to the Labrum

Sub-Spine Impingement: Primary crushing of the labrum, capsule and indirect head of the rectus
Direct impingement of the inferior femoral neck against the AIIS occurs with straight hip flexion.
This contact may result in clinical symptoms of hip flexor pain.

The anterior inferior iliac spine: Morphological classification in patients with hip impingement
Hetstroni, et al, CORR, in review
Different AIIS morphologies may predispose to increased “Sub-Spine Impingement.

<table>
<thead>
<tr>
<th>Type and Subtype</th>
<th>Description</th>
<th>CT Definitions</th>
<th>Clinical Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Upsloping</td>
<td>Upsloping on Ischium View</td>
<td>AIIS does not contribute to impingement</td>
</tr>
<tr>
<td>II</td>
<td>Flat</td>
<td>Flat or downsloping on ischium view, but does not cross the rim</td>
<td>AIIS may contribute to impingement</td>
</tr>
<tr>
<td>III</td>
<td>Downsloping</td>
<td>Downsloping and crosses the rim</td>
<td>AIIS may contribute to impingement</td>
</tr>
<tr>
<td>A</td>
<td>Clear sub-spine space</td>
<td>No secondary extension to rim</td>
<td>AIIS does not contribute to impingement</td>
</tr>
<tr>
<td>B</td>
<td>Sub-spine bone prominence, or rim level-based AIIS</td>
<td>Caudad extension of AIIS on ilium wall to acetabular rim level</td>
<td>AIIS may contribute to impingement</td>
</tr>
</tbody>
</table>

**Subspine Impingement Sign**
- Straight Flexion
- Anterior pain from abnormal contact between the inferior femoral neck and the AIIS during straight flexion due to AIIS morphology.

**Arthroscopic Sub-Spine Decompression**
- Sub-Spine Impingement: A variation of rim impingement?

*Making a Case for Anterior Inferior Iliac Spine / Subspine Hip Impingement: Three representative Case Reports and Proposed Concept*
Case series of three patients who underwent treatment for isolated sub-spine impingement with 2 years follow-up with mHHS = 100 points in all cases

*Arthroscopic decompression of the anterior inferior iliac spine leading to extra-articular hip impingement*
Hetstroni, et al, Arthroscopy, submitted for review
Case series of ten patients who underwent treatment for sub-spine impingement
All patients had Type IIB or Type III AIIS morphologies
Improvement in hip flexion from 99±7° to 117±8°
mHHS improvement from 64±18° pre-op to 98±2°

**Conclusions**
- Sub-spine impingement is a variation of traditional cam / rim impingement.
- On clinical exam provocative pain testing is greatest with straight flexion.
- Patients with downsloping or hooked AIIS morphology, or those with extension to or beyond the acetabular rim are at greatest risk.
- Arthroscopic decompression of the prominent AIIS provides predictable symptom relief and increased ROM.
Ischiofemoral Impingement

- There is increasing evidence for the presence of a previously unrecognised impingement-type condition around the hip – ischiofemoral impingement.
- This is caused by abnormal contact between the lesser trochanter of the femur and the ischium, and presents as atypical groin and/or posterior buttock pain.
- The symptoms are gradual in onset and may be similar to those of iliopsoas tendonitis, hamstring injury or bursitis.
- The presence of ischiofemoral impingement may be indicated by pain caused by a combination of hip extension, adduction and external rotation.
- Magnetic resonance imaging demonstrates inflammation and edema in the ischiofemoral space and quadratus femoris, and is distinct from an acute tear. To date this has only appeared in the specialist orthopaedic literature as a problem that has developed after total hip replacement, not in the native joint.

Trochanteric-Pelvic Impingement

- There is also increasing evidence for the presence of extra-articular impingement of the greater trochanter against the pelvis in certain morphologic variants.
- This can lead to pain and disability in the hip joint region that is not relieved by intra-articular injection.
- The most clinically obvious example of this is the varus deformity hip associated with Perthes disease requiring a relative neck lengthening.
- More subtle forms can be seen in relatively normal appearing hips.
- Alterations in femoral torsion can impact the relationship between the trochanter and pelvis.
- Increased femoral anteversion can lead to decreased space between the posterior facet of the trochanter and ilium leading to posterior trochanteric impingement in flexion and ER.
- Increased femoral retroversion can lead to decreased space between the anterior facet of the trochanter and the AIIS leading to anterior trochanteric impingement in flexion and IR.
- Dynamic ultrasound imaging is beginning to shed more light on these less obvious forms of extraarticular impingement.