3D Computed Tomographic Analysis of Frontal Recess Configuration in Pediatric Patients

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What is Frontal recess?
Frontal Recess pneumatization

• This space may be pneumatized by various anterior ethmoid cells:

1. Agger nasi cells (ANC)
2. Frontal cells (I-IV)
3. Supraorbital ethmoidal cells
4. Suprabullar cells (SBC)
5. Frontal bullar cells (FBC)
6. Interfrontal sinus septal cells
Uncinate Types & Frontal sinus drainage

Type I

Type II

Type III
What is unique about Frontal Recess?

1. Complex anatomy
2. High anatomical variation
3. Approximativity to the basal Lamina
Basal Lamina
Why is Frontal recess anatomy important?
Understanding Frontal Recess anatomy is the key for Safe & successful Frontal Sinustomy.
Literature review

• The anatomy of the paranasal sinus is significantly different between adults and children

• Most of the Literature is about adult frontal recess anatomy
Objective

Description of the frontal recess cells among pediatrics using CT scan
Study Design

• Ethical Committee approval
• Retrospective study
• Sinus CT scans performed from 2012 - 2014 at KAUH
• Patients aged <18 years

KAUH: King Abdullah University Hospital
Study Design- Exclusion Criteria

- Age ≥18 years
- Frontal sinusitis
- Sinonasal polyposis
- Congenital anomaly
- Growth delay
- Maxillofacial trauma
Methodology

• 1 mm thickness 3 views Bone window sinus CT

• standardized criteria for frontal recess pneumatization patterns described by Walter T. Lee others)1

• P value calculation was done using Chai square

1. 3D Computed Tomographic Analysis of Frontal Recess Anatomy in Patients Without Frontal sinusitis
Agger Nasi Cell
Frontal Cell type-Type I
Frontal Cell type-Type II
Frontal Cell types- Type III
Frontal Cell types- Type IV
Results

• A total of 50 patients (100 sides)

• Mean age: 11 years

• Gender distribution: 20 Female, 30 Male
Results

P value found to be > 0.05
## Results

<table>
<thead>
<tr>
<th></th>
<th>uncinate 1 (%)</th>
<th>2(%)</th>
<th>3(%)</th>
<th>P3&amp;1</th>
</tr>
</thead>
<tbody>
<tr>
<td>agger nassi</td>
<td>0.98</td>
<td>0.91</td>
<td>0.86</td>
<td>0.03</td>
</tr>
<tr>
<td><strong>frontal type 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>type 2</td>
<td>0.4</td>
<td>0.32</td>
<td>0.47</td>
<td></td>
</tr>
<tr>
<td>type 3</td>
<td>0.33</td>
<td>0.27</td>
<td>0.13</td>
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<tr>
<td>type 4</td>
<td>0</td>
<td>0</td>
<td>0.07</td>
<td>0.04</td>
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<tr>
<td>suprabullbar</td>
<td>0.51</td>
<td>0.68</td>
<td>0.73</td>
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<tr>
<td>frontal bullbar</td>
<td>0.1</td>
<td>0.18</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>supraorbital ethmoid cell</td>
<td>0.4</td>
<td>0.5</td>
<td>0.47</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 pneumatization relation to the type of the uncinate
Conclusion

• No statically significant difference in pneumatization between the Rt & Lt side

• Unicate process insertion in pediatric age group took similar pattern as in adult

• Type of uncinate process has an effect on the development of aggar Nassi & type 4 frontal cell
Future studies

• Reporting percentage from different pediatric ethnic group

• Comparison between the adult and pediatrics frontal recess pneumatization

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My Contribution to the Research

1. Literature Review

2. Para-nasal sinus CT scan review with my supervisor doctor

3. Data Statistical analysis using the Chai square
Thank You