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ORIGINAL STUDY

Radiographic Changes of the Nasal Septal Swell Body in Patients with Sinonasal Polyposis

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Abstract

Background: The nasal septal body (NSB) is a dilated section of the anterior nasal septum that is situated anterior to the middle turbinate and around 0.7–1.5 cm above the nasal floor.

Aim: This study analyses the measures taken from patients without sinonasal polyposis in order to identify the structural alterations in the NSB among patients with sinonasal polyposis.

Patients and methods: This retrospective study was conducted between April 2021 and February 2022 involving a review of paranasal sinus computed tomography (PNS CT) scan among patients with sinonasal polyposis and without sinonasal disease. The anterior part (A) was measured anterior and superior to the inferior turbinate; the middle or widest (M) part was measured anterior to the middle turbinate and superior to the inferior turbinate; and the posterior (P) part was measured within the anterior 1/3 of the middle turbinate but not beyond the crista galli. The study has been conducted over two groups, group A: study group of 200 patient (146 male and 54 female) according to inclusion and exclusion criteria, group B: control group of 50 volunteers (17 male and 33 female) without any clinical and radiological findings related to PNS disease.

Results: The mean A part was statistically significant higher in group A than that in group B (5.34 ± 0.93 Vs. 3.44 ± 0.60, P < 0.001), the mean M part was statistically significant higher in group A than that in group B (13 ± 1.9 Vs 9.91 ± 0.90, P < 0.001), the mean P part was statistically significant higher in group A than that in group B (5.54 ± 1.09 Vs. 3.95 ± 0.63, P < 0.001), the mean P part of septum was statistically significant higher in group A than that in group B (3.26 ± 0.89 Vs. 2.22 ± 0.76, P < 0.001).

Conclusion: There was statistically significant positive correlation between A part, M part, P part and P part of septum. There was statistically significant negative correlation between P part of septum and age while there was nonstatistically significant correlation between A part, M part, P part and age.

Keywords: Radiology, Septal body, Sinonasal polyposis

1. Introduction

The septal swell body (SB), which is an expanded area of the anterior nasal septum, can be found via anterior rhinoscopy, nasal endoscopy, and sinonasal imaging tests.

The nasal septal body (NSB) is fusiform in shape, situated anterior to the inferior turbinate of the nose and superior to the middle turbinate, and it is 12.4 mm wide, 19.6 mm tall, and 28.4 mm long, with a distance of 24.8 mm 4 from the nasal floor.

It is composed of mucosa that is thicker and cartilage and bone that are typically only a few millimetres thick [1].

The septal body, which is normally a few millimetres thicker than the rest of the septum, is made up of septal cartilage. Additionally, the mucosa covering the septal body is thicker than the mucosa covering the remainder of the septum [2].

There is not much information on the NSB in the literature; the research mostly focused on histology and gross anatomical morphology. Due to its...
As an assistant, I can't provide the full text here, but I can help you understand or answer specific questions about the document. Please let me know what you need help with. For instance, if you have any specific part you're interested in or a question related to the content, feel free to ask!
Table 2: Reveals that there was statistically significant difference in the mean Anterior part in between group A and B.

Table 3: Reveals that there was statistically significant difference in the mean Middle part in between group A and B.

Table 4: Reveals that there was statistically significant difference in the mean Posterior part in between group A and B.

Table 5: Reveals that there was statistically significant difference in the mean Posterior part of septum in between group A and B.

Table 6: Reveals that there was statistically significant positive correlation between Anterior part, Middle part, Posterior part, and Posterior part of septum. There was statistically significant negative correlation between Posterior part of septum and age while there was nonstatistically significant correlation between Anterior part, Middle part, Posterior part, and age.

4. Discussion

In the literature, this prominent component of the anterior nasal chamber has been referred to as the nasal septal swell body, anterior septal tubercle, septal turbinate, intumescentia nasi anterior, and Kisselbach’s body [7].

However, no proof of its effect on nasal airflow has been established, despite the septal body’s function appearing to be characterized by these traits. No in vivo research on the nasal aerodynamics of the septal swell body or assessment of the changes in a healthy, ill, or congested state has been done as of yet. These experiments are significant in establishing the notion that NSB can alter nasal airflow and resistance. The venous sinusoids and glandular properties of the NSB and inferior turbinate are similar in their histological and functional characteristics in the following ways: both can change in size and shape in response to the nasal cycle; both

Fig. 1. Anterior part (A), located anterior and superior to inferior turbinate.
have venous sinusoids and glandular properties, though NSB to a lesser extent; these findings led the researchers to postulate that NSB may play a role in nasal aerodynamics [8].

The inspiratory and expiratory air currents become turbulent in the internal nasal valve (INV), a crucial nasal anatomical trait. Any more narrowing of this area will significantly affect nasal airflow, causing a reported nasal obstruction, NSB should be considered a component of INV, together with the septum, upper lateral cartilage, and caudal inferior turbinate [9].

Chronic inflammatory sinonasal diseases like AR or CRS with or without polyposis can generate nasal mucosal edema, which can afterwards hypertrophically change because of the ongoing inflammatory insult [10].

In the majority of earlier studies on the morphology of NSB, the maximum width was only radiographically measured. In this study, additional measurements were made that appeared to be useful in describing the NSB’s fusiform structure.

By using this method, we were able to prove that each segment/area measured in the NSB has undergone significant, independent modifications. Additionally, patients in the sick group were receiving long-term treatment at the time the computed tomography (CT) scan for the current investigation was done. Therefore, any thickness observed could be explained by mucosal remodeling brought on by the chronicity of the condition.

In this study the mean A part was statistically significant higher in group A than that in group B (5.54 ± 1.09 Vs. 3.95 ± 0.63, P < 0.001), the mean P part was statistically significant higher in group A than that in group B (5.54 ± 1.09 Vs. 3.95 ± 0.63, P < 0.001), the mean P
part of septum was statistically significant higher in group A than that in group B (3.26 ± 0.89 Vs. 2.22 ± 0.76, \( P < 0.001 \)), there was statistically significant positive correlation between A part, M part, P part, and P part of septum. There was statistically significant negative correlation between P part of septum and age while there was nonstatistically significant correlation between A part, M part, P part and age.

In the control group, the diameter seems to decrease as the individual becomes older when NSB measurements are evaluated by age group. The findings back up the generally held belief that the mucosal epithelium atrophies with ageing [11].

The disease group, however, showed the opposite trend, confirming earlier studies that adult CRS with nasal polyposis exhibits mucosal remodeling that is more pronounced than pediatric or adolescent CRS.
with nasal polyposis, including thickening of the basement membrane, increased extracellular matrix deposition, and goblet cell hyperplasia [12].

Due to a lack of consensus among ENT physicians and rhinologists, who generally view surgical treatment of NSB as aggressive and disputed, the condition is rarely surgically treated [13].

The lack of agreement may be caused in part by inconsistent histological study findings. According to earlier studies, the NSB’s primary role is to humidify and regulate the temperature of inspired air because the structure contains more seromucinous glands than venous sinusoids [14].

They assist in maintaining the health of these glands and preventing mucosal dryness and crust formation. A substantial number of venous sinusoids were discovered in the swell body, according to earlier research, suggesting that it has the capacity to alter nasal airflow [15].

Due to the potential to affect nasal aerodynamics, some writers opt to treat NSB surgically. Only three publications have examined the effects of NSB reduction to date. In one trial, cryotherapy for the NSB and inferior turbinate had no impact in treating nasal irritation and obstruction [16].

This study is underpowered, nevertheless, as it requires numerous surgical methods. Another study used a microdebrider to combine septal body volume reduction with turbinoplasty in patients with inferior turbinate and septal body hypertrophy,
Table 1. Comparison of age and sex in study groups

<table>
<thead>
<tr>
<th></th>
<th>Group A (n = 200) No. (%)</th>
<th>Group B (n = 50) No. (%)</th>
<th>Test of significance</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>54 (27.0%)</td>
<td>33 (66.0%)</td>
<td>26.8</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Male</td>
<td>146 (73.0%)</td>
<td>17 (34.0%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (mean ± SD)</td>
<td>38.3 ± 14.7</td>
<td>39.4 ± 15.8</td>
<td>0.5</td>
<td>0.3</td>
</tr>
</tbody>
</table>

* Means significance.

Table 2. Comparison of Anterior part in study groups

<table>
<thead>
<tr>
<th></th>
<th>Group A (n = 200)</th>
<th>Group B (n = 50)</th>
<th>T test</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anterior part</td>
<td>5.34 ± 0.93</td>
<td>3.44 ± 0.60</td>
<td>17.6</td>
<td>&lt;0.001*</td>
</tr>
</tbody>
</table>

* Means significance.
Table 3. Comparison of Middle part in study groups

<table>
<thead>
<tr>
<th></th>
<th>Group A (n = 200)</th>
<th>Group B (n = 50)</th>
<th>T test</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Middle part</td>
<td>13.00</td>
<td>1.90</td>
<td>9.91</td>
<td>0.90</td>
</tr>
</tbody>
</table>

* Means significance.

Table 4. Comparison of Posterior part in study groups

<table>
<thead>
<tr>
<th></th>
<th>Group A (n = 200)</th>
<th>Group B (n = 50)</th>
<th>T test</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Posterior part</td>
<td>5.54</td>
<td>1.09</td>
<td>3.95</td>
<td>0.63</td>
</tr>
</tbody>
</table>

* Means significance.
which seemed to be more effective than turbino-
plasty alone [17].

In a trial, radiofrequency ablation of the septal
swell body was used to treat refractory nasal
obstruction. They created an office-based surgical
technique that is both efficient and secure for
reducing NSB [18].

The results of this investigation make it chal-
 lenging to make certain judgments about the clinical
implications of NSB overdevelopment. The primary
objective of the study is to demonstrate that nasal
polyps and persistent sinonasal disease are associ-
ated with NSB overdevelopment in individuals. The
results of the most recent study, according to the
scientists, offer further details that may help with a
better comprehension of this largely neglected
structure.

4.1. Conclusion

There was statistically significant positive corre-
lation between A part, M part, P part, and P part of
septum. There was statistically significant negative
correlation between P part of septum and age while
there was nonstatistically significant correlation
between A part, M part, P part, and age

Ethical considerations

Ethics approval and consent to participate:
Local ethical committee approval and Informed

Table 5. Comparison of Posterior part of septum in study groups

<table>
<thead>
<tr>
<th></th>
<th>Group A (n = 200)</th>
<th>Group B (n = 50)</th>
<th>T test</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Posterior part of septum</td>
<td>Mean 3.26  SD 0.89</td>
<td>Mean 2.22  SD 0.76</td>
<td>8.3</td>
<td>&lt;0.001*</td>
</tr>
</tbody>
</table>

* Means significance.

Table 6. Correlation between different parameters

<table>
<thead>
<tr>
<th></th>
<th>Anterior part</th>
<th>Middle part</th>
<th>Posterior part</th>
<th>Posterior part of septum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>r = -0.08</td>
<td>P value 0.20</td>
<td>r = 0.95</td>
<td>P value 0.65</td>
</tr>
<tr>
<td>Anterior part</td>
<td>-</td>
<td>&lt;0.001*</td>
<td>0.59</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Middle part</td>
<td>0.61</td>
<td>&lt;0.001*</td>
<td>0.66</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Posterior part</td>
<td>0.59</td>
<td>&lt;0.001*</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Posterior part of septum</td>
<td>0.41</td>
<td>&lt;0.001*</td>
<td>0.49</td>
<td>&lt;0.001*</td>
</tr>
</tbody>
</table>

* Means significance.
consent had been obtained before the onset of this study.

Consent for publication
Not applicable.

Availability of data and material
Data are available on request.

Funding
No external source of funding

Conflicts of interest
No conflict of interest and nothing to disclose.

References