

The Role of Computed Tomography in The Diagnosis of Nasal Septal Deviation

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Background: Deviated nasal septum is one of the frequent conditions seen regularly in otolaryngology clinics. The diagnosis of a deviated septum is commonly established with physical examination without the use of additional imaging modalities. No clear guidelines are available yet for the use of imaging modalities in diagnosing deviated septum.

Objective: To evaluate Computed Tomography (CT) scanning in the diagnosis of the deviated nasal septum.

Design: A Retrospective Review.

Method: A retrospective review of seventy-two patients booked for corrective septal surgery (septoplasty) was conducted. Each patient's record was reviewed for CT request prior to surgery and if deviated nasal septum was mentioned in the report.

Result: Seventy-two patients were included in the study, 27 (37.5%) females and 45 (62.5%) males. Age ranged from 16 to 72 years (mean of 31.58). Twenty-two (30.5%) patients had CT imaging prior to surgery; two (2.7%) scans were for patients booked for only septoplasty surgery. Twenty-one (29.2%) of the scans reported deviated nasal septum in the report. One (1.4%) report mentioned central nasal septum.

Conclusion: CT imaging is not crucial for the diagnosis of simple deviated nasal septum; its role is more pronounced in complex cases where other pathologies of the nasal tract are suspected to cause the patient symptoms.

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Nasal septal deviation is a frequently seen condition in otolaryngology, prevalence up to 76% in some populations¹. The nasal septum consists of bone and cartilage and runs throughout the middle of the nasal cavity. The septum can be deviated or kinked due to a congenital anomaly or acquired trauma. Many people have some sort of imbalance in the size of their breathing passages. The deviation might be unnoticed or results in variable clinical presentation such as cosmetic concern, noisy breathing, or even complete obstruction of one or both nostrils. Diagnosis of nasal septal deviation is clinical, based on anterior rhinoscopy and nasal endoscope. Treatment of nasal obstruction due to a deviated septum may include the use of medication to reduce tissue swelling, yet, surgery is often necessary to correct the deviation to alleviate patient symptoms.

Imaging is occasionally performed as part of the deviated septum assessment. CT scanning of the nose and paranasal sinuses is one of the common imaging modalities used in otolaryngology. CT could recognize pathological findings that could not be found on physical examination and is helpful to decide the location and the type of surgery². However, no strict guidelines are available for the diagnostic use of CT scanning in nasal septal deviation.

The aim of this study is to evaluate computed tomography (CT) scanning in the diagnosis of the deviated nasal septum.

METHOD

A review of all patients booked for septoplasty surgery between June 2017 and July 2018 was performed. All patients booked for septoplasty surgery during the study period were included.

The data was documented using Microsoft Excel. The following were documented: patient's age, sex, date of surgery and whether the patient had another procedure with the septoplasty. Finally, search for any CT scans of the nasal bone and paranasal sinuses before the surgery was performed. The results were documented as to whether a deviated septum was reported or not and the date of imaging.

The CT scans were performed using the following scanners: Siemens 128 slice SOMATOM Definition Edge® (syngo CT VA48A) and GE 64 slice Optima 660®. Scans were read and reported by certified radiologists.

RESULT

Seventy-two patients were found, 27 (37.5%) females and 45 (62.5%) males, see figure 1. Age ranged between 16 and 72 (mean of 31.58).

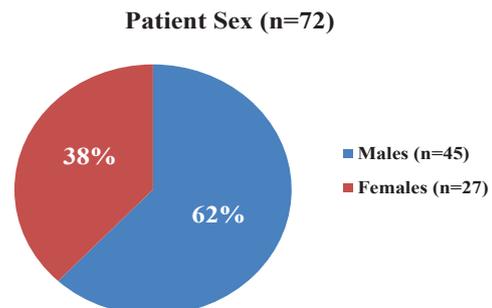


Figure 1: Number of Males and Females

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Eighteen (25%) patients were scheduled for septoplasty surgery compared to 54 (75%) who had other procedures performed with the septoplasty: 23 (32%) turbino-plasty, 6 (8.3%) FESS, 13 (18%) septorhinoplasty, the remaining 12 (17%) patients had other procedures, see figure 2.

Twenty-two (31%) patients had CT imaging prior to surgery compared to 50 (69%) who did not have CT imaging, see figure 3. Two (2.7%) scans were for patients booked for only septoplasty surgery. Twenty-one (29.2%) scans reported deviated nasal septum. One (1%) report mentioned central nasal septum.

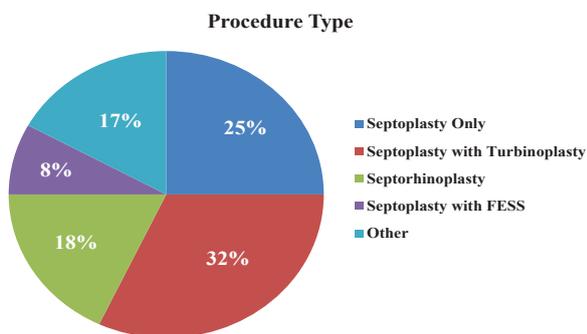


Figure 2: Procedure Type

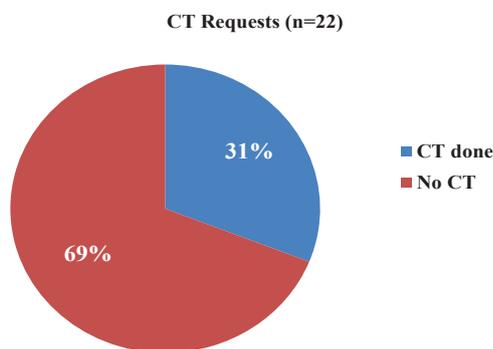


Figure 3: CT Requests

DISCUSSION

CT imaging is one of the modalities which provide the physicians with details that could not be seen on regular physical exam. It has an invaluable role in the diagnosis of various diseases in otolaryngology, as well as in guiding patient's management. Multiple studies have shown its importance, especially with pathologies involving deep structures such as the paranasal sinuses and soft tissue^{3,4}. However, its role in the deviated nasal septum is debatable; while some studies have shown that it is unnecessary for the diagnosis and management of deviated septum, others revealed that it can significantly influence the surgical management⁵⁻⁹.

Several studies have shown the limited use of CT for the diagnosis of deviated nasal septum. Ardeshipour et al reported that the correlation between septal deviation findings on CT scans and patient's symptoms of nasal obstruction is weak⁵. It was concluded that they do not support CT scans as a clinically necessary test to investigate uncomplicated nasal obstruction⁵. This poor correlation was also described by Sedaghat et al in which they concluded, "CT is a poor substitute for physical examination, the gold standard, in the assessment of septal deviation"⁷. Furthermore, a literature review by Wotman et

al revealed that reliance on CT for selection of septoplasty candidates is discouraged. "CT was shown to underestimate the findings of nasal endoscopy for deviations of the internal nasal valve. Moreover, subjective symptoms of nasal obstruction did not correlate with anatomical parameters measured with CT at the internal nasal valve. On the other hand, preoperative CT can be helpful in identifying ancillary sinonasal pathologies contributing to nasal obstruction, especially concha bullosa and sinusitis. However, given the additional costs and exposure to radiation associated with CT, preoperative imaging should only be requested for a subset of patients⁶."

On the other hand, CT could help in the management of complicated cases of deviated nasal septum. CT may reveal pathological findings, which are difficult to visualize on clinical examination and thus helps in guiding the surgery type and location. Surgical interventions aided by the pre-operative imaging can be more effective in resolving the patient's nasal obstruction⁸. Günbey et al recommended CT prior to septoplasty surgery especially in complex cases where severe deviation is present, which prevents examining the posterior nasal space, or when sinus disease is suspected, as this can help in planning septoplasty⁹.

This study has some potential limitations, which includes relatively small sample size, as well as the fact that only a small number of patients had a diagnosis of deviated nasal septum alone and the majority having complex diagnoses; in addition to the limitation of being retrospective study. These limitations can be potentially overcome by expanding the study's time-period to include more patients.

CONCLUSION

Our study showed that the majority of patients did not need CT scanning to establish the diagnosis of deviated nasal septum. Physical examination with anterior rhinoscopy and nasal endoscopy was able to establish the diagnosis in the majority of cases. The use of CT imaging was limited to patients where complex diagnosis is suspected.

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