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Characteristics and Computed Tomography Findings of Deviated Nasal Septum Patients at Dr. Mohammad Hoesin Hospital Palembang

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ABSTRACT

Introduction. The deviated nasal septum is found in 80% of people in the world either with or without specific symptoms. Mladina has divided the classification of deviation of the septum nasi into seven parts based on the findings of the deviation to facilitate the determination of diagnosis, therapy, and which type often appears. This study aims to determine the characteristics of patients with a deviated nasal septum at Dr. Mohammad Hoesin General Hospital Palembang from January to December 2021. **Methods.** Data was obtained from medical records of patients with a deviated nasal septum at Dr. Mohammad Hoesin General Hospital Palembang from January to December 2021. **Results.** The majority of patients were in the age range of 16-25 years (37.8%) and male gender (64.9%). The most common etiology was congenital (86.5%). Clinical manifestation mainly is nasal obstruction (94.6%), and the most common secondary diagnoses found are concha hypertrophy (54%) and allergic rhinitis (16.2%). The most common pathological condition was narrowed cavum nasal (91.9%). The majority of patients had type III deviation (51.4%). All patients were treated with septoplasty (100%). **Conclusion.** Most patients are predominantly male aged between 16-25 years. Congenital factors primarily caused this condition, leading to complaints of nasal obstruction. Secondary diagnoses included concha hypertrophy and allergic rhinitis. Physical examinations often revealed a narrowed nasal cavity. Most patients exhibited type III septal deviation and all patients were treated with septoplasty.

1. Introduction

The nose is one of the body parts with a complex three-dimensional structure and plays an important role in facial aesthetics. The shape of the nose itself is influenced by its constituent parts. The outer part of the nose is composed of bone and cartilage. Not only that, the nose also has an active function in the physiology of respiration and sniffing. Both of these functions are closely related to the flow of air into the nose.[1,2]

The anatomical shape of the nose can be likened to a pyramid, with the base being where the nostrils are attached. In between, there is a septum or barrier from the upper tip of the nose to the center of the upper lip that divides the nasal cavity into right and left parts. The nasal septum itself is formed by bones and cartilage such as the ethmoid bone, vomer, maxillary os nasalis crest, and palatine os nasalis crest. Several nasal abnormalities can be found in its anatomy, one of which is the septum, and the most commonly found are septal deviation, septal hematoma, and septal abscess.[2,3]

According to the American Academy of Otolaryngology-Head and Neck Surgery, 80% of people worldwide experience a deviated nasal septum, either with or without special symptoms. One study also showed that 63 out of 130 people, or nearly 50% of people, had a nasal septum deformity. The prevalence of nasal septum deviation varies in children, around 2.9% and 25%. Another study says that the incidence rate of septal deviation reaches 90% which consists of various types of classifications of septal deviation itself. Sriprakash also stated in his study that out of 446 patients, 138 had a deviated nasal septum.[4–7]

Normally, the septum is located in the middle of the nose in a straight position. However, in some adults with abnormalities, the septum is not in its proper position. The nasal septum is also one of the constituents of the inside of the nose. Not all deviations of the septum cause disturbances, only severe deviations of the septum will result in narrowing on one side of the nose, so that if there is a deviation in shape or malformation, for example due to trauma or congenital birth, it will cause disturbances and nasal obstruction.[2,3]

The most common complaint in septal deviation patients is nasal obstruction. The obstruction can be unilateral and bilateral due to the hypertrophied concha as a compensatory mechanism. Hyposmia,

anosmia, epistaxis, and headache are other symptoms that may occur in patients with deviated nasal septum. Dr. Mladina herself has divided the classification of deviated nasal septum into seven parts based on the findings of the deviation to facilitate diagnosis, therapy, and which types appear frequently.[3,5,8]

The diagnosis of deviated nasal septum is complex and can be made in various ways. To determine the right therapy, it must be based on the right examination. The gold standard examination in determining septal deviation is by direct observation during physical examination using rhinoscopy and endoscopy. In addition, the definitive examination is a computed tomography examination. In this era of evidence-based medicine, the findings of computed tomography are one of the strongest pieces of evidence in determining the next steps for managing septal deviation patients. The findings of computed tomography are able to provide additional information that may not be obtained by physical examination alone.[9,10]

Reviewing the function of the nose as facial aesthetics, respiration function, and olfactory, it can be concluded that the presence of a deviated nasal septum in a person will be able to reduce the quality of life, especially when complications occur. Based on the background that has been conveyed, the researcher believes that it is necessary to conduct research on the characteristics of patients with deviated nasal septum and the results of computed tomography findings at Dr. Mohammad Hoesin General Hospital Palembang for the period January - December 2021.

2. Methods

The type of research used is descriptive observational using secondary data, namely the observation of medical records of patients with deviated nasal septum at Dr. Mohammad Hoesin General Hospital Palembang for the period January - December 2021. The sample in this study included patients with a deviated nasal septum at Dr. Mohammad Hoesin Palembang Hospital from January 1, 2021, to December 31, 2021, who met the inclusion criteria. The inclusion criteria in this study were patients with deviated nasal septum at Dr. Mohammad Hoesin General Hospital Palembang during 2021 who underwent a complete physical and supporting examination in the form of computed tomography.

The data from this study have been processed using the Statistical Package for Social Science (SPSS) program. Data analysis in this study was carried out by univariate statistical analysis. Furthermore, the data obtained are presented in the form of frequency tables and explained in the narrative.

3. Results

There were 37 patients with septal deviation The patients who met the inclusion criteria were included in this study. The data observed and processed in this study were grouped based on patient age, gender, etiology, clinical manifestations, comorbidities, physical examination results, type of deviation, and therapy given to the patient.

In this study, the age of patients with deviated nasal septum as research subjects was divided into 7 age groups. From a total of 37 patients, the age category of 16-25 years was found to be the highest with a total of 14 research subjects (37.8%) and the lowest was at the category <6 years and 6-15 years because there were no patients (0%) in these categories (table 1). Majority of patients were male as many as 24 people (64,9%) and followed by female patients as many as 13 people (35.1%, Table 2).

In this study, there were 4 groups of categories of deviated nasal septum causes, namely sports injuries, fights, traffic crashes, and congenital (table 3). The highest etiology was congenital in 32 patients (86.5%), 1 person (2.7%) with sports injury etiology, 4 subjects (10.8%) with traffic accident etiology, and the lowest was fights with no patients found in this etiology (0%). Each patient had a variety of complaints, almost all of which had more than 1 complaint (Table 4). Patients mainly experienced unilateral nasal obstruction or bilateral. Furthermore, the results of the research analysis found that 22 people (59.4%) experienced headache, followed by nasal discharge, post-nasal drip, pain in the eye area, olfactory impairment, and epistaxis respectively.

It was found that there were several patients who had more than 1 comorbidity and there were also those who did not have a secondary diagnosis (Table 5). Most common comorbidities in the study subjects were concha hypertrophy and allergic rhinitis, which has 20 people (54%) for each. It was also found that 10 people (16.2%) had rhinosinusitis. For obstructive sleep apnea itself, 1 person (2.7%) was found and last there were no patients who complained of ear infections.

The most common pathological finding was a narrowed nasal cavity (Table 6). Furthermore, there was concha hypertrophy in 20 people (54%), the presence of serous secretions in 18 research subjects (48.6%), narrowed OMC in 16 people (43.2%), the presence of masses in 4 people (10.8%), and bleeding in 3 people (8.1%).

The results of the frequency distribution analysis of the type of deviated nasal septum in the subjects of this study are presented in the Table 7. In this study, the types of deviation were divided into 7 types by Mladina and were determined based on the results of computed tomography readings. Based on the results of the analysis, it was found that the most common type in the study subjects was the type III as it was found 19 patients in this

category (51.4%) and the lowest were type I and type VII where there were no patients within these types. In addition, type II and type IV were found as many as 6 people each (16.2%). The results also showed that there were 5 people (13.5%) and 1 person (2.7%). All patients with deviated nasal septum who became the subject of the study were given the therapy of septoplasty (Table 8).

Table 1. Frequency Distribution of Deviated Nasal Septum Patients Based on Age

Age	Number (n)	Percentage (%)
<6 years	0	0%
6-15 years	0	0%
16-25 years	14	37,8%
26-35 years	6	16,2%
36-45 years	9	24,3%
46-55 years	5	13,5%
>55 years	3	8,1%

Table 2. Frequency Distribution of Deviated Nasal Septum Patients Based on Gender

Gender	Number (n)	Percentage (%)
Male	24	64,9%
Female	13	35,1%

Table 3. Frequency Distribution of Deviated Nasal Septum Patients Based on Etiology

Etiology	Number (n)	Percentage (%)
Sports injuries	1	2,7%
Fights	0	0%
Traffic crashes	4	10,8%
Congenital	32	86,5%

Table 4. Frequency Distribution of Deviated Nasal Septum Patients Based on Clinical Manifestations

Clinical Manifestations	Number (n)	Percentage (%)
Nasal obstructions	35	94,6%
Olfactory impairment	5	13,5%
Headache	22	59,4%
Eye area pain	7	18,9%
Post nasal drip	12	32,4%
Nasal discharge	13	35,1%
Epistaxis	4	10,8%

Table 5. Frequency Distribution of Comorbidities in Deviated Nasal Septum Patients

Comorbidities	Number (n)	Percentage (%)
Concha hypertrophy	20	54%
Rhinosinusitis	10	16,2%
Allergic rhinitis	20	54%
Obstructive sleep apnea	1	2,7%
Ear infections	0	0%
Polyps	4	10,8%

Table 6. Frequency Distribution of Other Pathological Findings Based on Physical Examination Results

Other pathological findings	Amount (n)	Percentage (%)
Narrowed nasal cavities	34	91,9%
Narrowed OMC	16	43,2%
Conchal hypertrophy	20	54%
Bleeding	3	8,1%
Secretions	18	48,6%
Mass	4	10,8%

Table 7. Frequency Distribution of Deviation Type in Deviated Nasal Septum Patients

Type of Deviation	Number (n)	Percentage (%)
Type I	0	0%
Type II	6	16,2%
Type III	19	51,4%
Type IV	6	16,2%
Type V	5	13,5%
Type VI	1	2,7%
Type VII	0	0%

Table 8. Frequency Distribution of Deviated Nasal Septum Patients Based on Therapy

Therapy	Number (n)	Percentage (%)
Medication	0	0%
Submucosal resection	0	0%
Septoplasty	37	100%

4. Discussion

This study was conducted in the medical record installation and ORL-HNS medical department of Dr. Mohammad Hoesin General Hospital Palembang from October 7th to October 23rd, 2022 and obtained 54 medical record data. Furthermore, data have been analyzed and processed to see medical records that meet the inclusion criteria of this study and 37 patients with deviated nasal septum were found to meet the inclusion criteria. There are 8 variables that have been studied and analyzed in this study, namely age, gender, etiology, clinical manifestations, comorbidities, physical examination results, type of deviation, and therapy given to patients.

In this study, the highest age of patients with deviation nasal septum was in the range of 16-25 years (37.8%), followed by the age range of 36-45 years as many as 9 people (24.3%). Next in the age range 26-35 years found as many as 6 people or about 16.2%. 5 patients in the study subjects were aged 46-55 years (13.5%) and the remaining 3 people were in the age range >55 years (8.1%). For age categories <6 years and 6-15 years, no research subjects were found in these categories. These results are in line with research conducted by Sriprakash in the International Journal of Otorhinolaryngology and Head and Neck Surgery in 2017 which showed similar things in his research that patients with deviated nasal septum was mostly in the age range of 16- 25 years with a percentage of 43.5% of the total sample.[7] With different age group categorizations, research conducted by Thakur et al. (2021) conveyed that the age range >20 years was the largest age group in the research subjects.[11]

Furthermore, the results of gender variables of research subjects have been presented in Table 2. From the table, we can see that out of the 37 research subjects, men dominate with a total of 24 people (64.9%) compared to women who are only about 13 people (35.1%). This is similar to the research conducted by Mustain, et al. (2022) that patients with deviation nasal septum most likely are male. In addition, the same results were also shown by Sriprakash, in his study which stated that deviated nasal septum patients are dominated by men.[7,12]

In the etiology variable, it has been divided into 4 main etiologies, which are sports injuries, fights, traffic accidents, and congenital. The results of the data analysis showed that of the 37 patients with deviated nasal septum, 32 of them were caused by congenital or abnormalities that have existed since birth or around 86.5% and then followed by traffic accidents as the second most common etiology in this study subjects with 4 people are in (10.8%). At the time of the accident, there was a history of hitting the face on the asphalt so that it was likely to be the main cause of the deviation of the nasal

septum. In the results of the study, only 1 person was found who said that there was a history of injury during sports (2.7%) and in the study subjects were not found (0%) who had a history of fighting which resulted in the deviation of the nasal septum in the patient. Although it is not in line with what was stated in the scientific publication of the ORL-HNS Faculty of Medicine Udayana University in 2018 that trauma is the main cause of deviated nasal septum, congenital remains one of the etiologies that cannot be avoided. Because even in healthy people, someone without a history of trauma can experience a deviation in the nasal septum.[4,13] In another study conducted by Thakur et al. (2019) the percentage of patients with a history of trauma and non-trauma did not show a significant difference of only 4%.[11] In the medical records themselves, some patients denied a history of trauma so it is suspected that the cause of the patient's deviated nasal septum is congenital. In addition, there were several other causes found in the medical record, namely trauma due to hitting the table and falling.

For clinical manifestations, it is found that most patients complained of more than one symptom. The symptoms found were quite diverse. The most common clinical manifestation complained of by patients was nasal obstruction with 35 out of 37 research subjects (94.6%) both unilateral and bilateral. This is in line with research conducted by Sriprakash (2017) that 86.2% or around 119 of 138 patients in his study complained of nasal obstruction.[7] Then, 22 people or about 59.4% were complaining of pain in the head. Nasal discharge and post-nasal drip were complained by 13 and 12 people out of 37 research subjects, respectively. 7 people (18.9%) of the total sample of research subjects also complained of pain in the eye area. In addition, due to nasal obstruction, physiological sense of smell can also be impaired if there is a deviation in the upper part of the septum as complained by 5 patients in this study (13.5%).[3] The next 4 patients (10.8%) complained of nosebleeds. Similar to what AlQahtani et al. (2020) stated that although epistaxis was not the majority of complaints found, there were still patients in their research subjects who complained of nosebleeds.[14] Apart from the clinical manifestations found in the research category, there are several other complaints felt by patients such as heaviness in the cheeks, discomfort, double vision, and facial heaviness especially when prostrating.

Generally, deviation of the nasal septum is associated with comorbidities as patients presented with complications. Similar to clinical manifestations, patients can present with more than one comorbidity. In this study, the most common comorbidities were concha hypertrophy and allergic rhinitis with each found as many as 20 people (54%). This is related to the compensatory mechanism carried out by the nose in patients with deviated nasal septum which will later be associated with nasal obstruction. Besides that, it was also said in the research of Sriprakash (2017) that rhinitis became the second most common complaint after nasal obstruction which was found in many patients with deviated nasal septum, as many as 34.8%.[3,7] Next, sinusitis was also found in 6 research subjects or around 16.1%. Although not in line with research conducted by Alsaggaf et al. (2022) which states that in 84.4% of patients with deviation of the nasal septum, sinusitis was found, but deviation of the nasal septum can block the sinus ostium so that it will be a predisposing factor for sinusitis.[3,15] Furthermore, rhinosinusitis was found in 4 patients (10.8%) just like polyps. One patient was also found to have obstructive sleep apnea. For ear infection itself, there were no patients who complained of ear infection or pain.

Physical examination is a key modality in helping to establish the diagnosis, including in patients with deviated nasal septum. Of 37 subjects of this study, all were given physical examination. As a result, narrowed nasal cavity was found to be the most common category found in the subjects, as many as 34 people (91.9%). The narrowing of the nasal cavity is caused by anatomical abnormalities such as deviation of the nasal septum. Furthermore, there were 20 research subjects (54%) who experienced concha hypertrophy and 18 people (48.6%) had secretions during physical examination.

If there is a narrowing or obstruction of the OMC (osteomeatal complex), it will cause a pathological process in the associated sinus and cause sinusitis.[16] In this study, 16 people (43.2%) were found with a pathological condition of narrowed OMC. In the other two categories, namely mass and bleeding, 4 people (10.8%) and 3 people (8.1%) were found respectively.

From the various classifications presented by experts, this study uses the Mladina classification which divides the deviation of the nasal septum into seven types. From the results of computed tomography readings of 37 research subjects, 19 people (51.4%) had type III deviation of the nasal septum, where in this type the deviation occurred vertically posteriorly and had touched the nasal valve deeply enough. This is in line with research conducted directly by Mladina that type III is the most commonly found type. Slightly different from the research conducted by AlQahtani et al that type III was the second most common type found in their research subjects.[5,14] Furthermore, there are types II and IV which are found in the same number, which are 6 people each (16.2%). Almost similar to type II and type IV, as many as 5 people or about 13.5% had type V nasal septum deviation. In the study, only one patient was found to have type VI septum deviation (2.7%) and no patient was found in type I and type VII. For type I, no patient was found because the

patient did not experience complaints so it is why that he did not come to the hospital.[5]

In the last variable, which is therapy. There are 3 categories, namely medication, submucosal resection, and septoplasty. In this study, it was found that of 100% of the study subjects, septoplasty was performed to all. This is in line with what Mladina said that septoplasty is the main therapy in patients with deviation of the nasal septum.[5] In addition, the study also found other treatments according to the comorbidities experienced by the patient.

5. Conclusion

From the results and discussion of research on the characteristics of deviated nasal septum patients and computed tomography findings at Dr. Mohammad Hoesin General Hospital Palembang from January to December 2021, we can conclude that the majority of were in the age range of 16-25 years (37.8%). They were mostly male (64.9%) or almost twice as many as female patients. The most common etiology was congenital (86.5). In each patient, more than one clinical manifestation was found, mostly were complaining about nasal obstruction (94.6%). Secondary diagnoses were found in the form of concha hypertrophy (54%) and allergic rhinitis (54%). In the physical examination, other pathological conditions were found. The narrowed nasal cavity was the most common finding (91,9%). The most common type of deviation found in patients was type III (51.4%). The therapy given to patients was 100% septoplasty.

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