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Anatomic Variation of CT Scan in Chronic Rhinosinusitis Patients in Sanglah Provincial General Hospital

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The anatomical abnormalities of the nose and paranasal sinuses are the most common causes of rhinosinusitis. These anatomical variations can cause obstruction of the ostiomeatal complex (OMC) and interfere with the mucociliary clearance which allows the occurrence of chronic rhinosinusitis. Knowing the anatomic variations of the nose and paranasal sinuses in rhinosinusitis patients whose undergo operative procedure at Sanglah Provincial General Hospital is important because it can be used as a reference for proper intervention to treat rhinosinusitis. This research is a descriptive study in the Ear Nose Throat - Head Neck Departement, Udayana University Medical School / Sanglah Provincial General Hospital Denpasar, from January 2018 to December 2018. The research location is at the ENT clinic, Sanglah Hospital, Denpasar. This research will be conducted in approximately 2 months (January 2019 to February 2019). The sample from this study was all rhinosinusitis patients who underwent operative procedure, both male and female for the period of 1 January – 31 December 2018. Based on the results of the research data, it was found that the most anatomic variation was septal deviation which was 24 people Anatomic variations cause chronic sinusitis by causing obstruction in the ostiomeatal complex (OMC) and affecting the mucociliary transport pattern. The most anatomical variation in this study is septal deviation.

Keywords: Anatomical Variations; CT-scan; rhinosinusitis.

Rhinosinusitis is inflammation of the nasal mucosa and paranasal sinuses that occur due to the expansion or spread of rhinitis. Anatomical abnormalities of the nose and paranasal sinuses are the most common causes of rhinosinusitis.[1] The term rhinosinusitis has recently been used to replace the term sinusitis because of the rare stand-alone sinus mucous inflammation. One of the main causes of rhinosinusitis is a drainage disorder in the patency of the ostiomeatal complex. The anatomical variations of the nose and paranasal sinuses such as frontal cells, agger nasi cells, ethmoid bulla, uncinate process, concha bullousa, Haller cells and septal deviation are among the factors causing nasal drainage and paranasal sinuses and are thought to be predisposing factors to chronic rhinosinusitis. These anatomical variations can cause obstruction of the ostiomeatal complex (OMC) and interfere with the clearance of mucocilia which allows chronic rhinosinusitis to occur.[2]

Anatomical description of the paranasal sinus on a CT scan is the initial condition that must

be known before surgery. CT scan is a good method for evaluating anatomical structures because it can clearly show the anatomical structure of the nose and paranasal sinuses such as ostiomeatal complex conditions, anatomic abnormalities, visualization of the presence or absence of pathological tissue in the sinuses and its expansion. CT scan is able to provide an overview of the anatomical structure in the area that is not visible through endoscopy. This examination is very good in showing anterior ethmoid cells, two thirds of the nasal cavity and recessus frontalis. In this area the CT scan can show the location of the causes of chronic sinusitis, namely the osteomeatal complex.[3] The diagnosis of anatomic variation is established based on clinical symptoms, anterior rhinoscopy, nasoendoscopy and computer tomography. These anatomical variations should be clearly identified before performing surgical procedures to prevent surgical complications and adequate management to prevent sequelae or recurrence of the disease.

Knowing the anatomic variations of the nose and paranasal sinuses in rhinosinusitis patients undergoing operative action at Sanglah Provincial General Hospital is important because it can be used as a reference for proper intervention to treat rhinosinusitis.

Tabel 1. Distribution of rhinosinusitis patients based on age range

Age Range	n	(%)
15-24	5	13,9
25-34	5	13,9
35-44	6	16,7
45-54	14	38,8
>55	6	16,7
Total	36	100

The age of the majority of patients is 45-54 years (38.8%), while the lowest is 15-24 years and 25-34 years (13.9%).

Tabel 2. Distribution of rhinosinusitis patients by gender

Gender	n	%
Male	25	69,4
Female	11	30,6
Total	36	100

Based on the results of descriptive statistics on the research data, male patients were 25 (63.4%) and female patients were 11 (36.6%).

Tabel 3. Distribution of location of paranasal sinuses with rhinosinusitis patients undergoing surgery

ParanasalisSinus	n	%
Maxillary Sinus	29	37,2
Frontal Sinus	12	15,4
Sphenoid Sinus	11	14,1
Ethmoid Sinus	26	33,3

METHODS

This research is a descriptive study in the Section of Ear Nose Throat – Head Neck Department of Udayana University / Sanglah Provincial General Hospital, Denpasar, from January 2018 to December 2018. The research location is at the ENT-Head Neck clinic of Sanglah Hospital, Denpasar. This research will be conducted in approximately 2 months (January 2019 to February 2019). Samples from this study were all rhinosinusitis patients who underwent operative actions, both male and female for the period of 1 January – 31 December 2018. The inclusion criteria of this study were patients over the age of 15 years old and rhinosinusitis which had impaired ventilation. The exclusion criteria of

Table 4. Anatomical variation of CT scan of rhinosinusitis patients undergoing surgery

Anatomical Variations	n
Septum deviations	24
Concha hypertrophy	17
Concha bullosa	5
Paradoxical Middle Turbinate	0
Haller cells	4
Agger Nasi cells	1
Onodi air cells	1
Sphenoid sinus pneumatization	4
Prominent ethmoid bulla	1
Uncinate process pneumatization	2

Based on the results of the research data, it was found that the most anatomic variation was septal deviation of 24 people.

this study was to have had previous nose surgery and had a history of nasal trauma. The analysis in this study was univariate analysis (descriptive statistics). Univariate analysis aims to describe the characteristics of the subject and other variables. Univariate analysis is displayed in the form of a frequency distribution table.

RESULTS

The research subjects were rhinosinusitis patients who underwent surgery at Sanglah Hospital Denpasar in the period January-December 2018.

The age of the majority of patients is 45-54 years (38.8%), while the lowest is 15-24 years and 25-34 years (13.9%).

Based on the results of descriptive statistics on the research data, male patients were 25 (63.4%) and female patients were 11 (36.6%).

Based on the results of the study data, the location of the most paranasal sinuses was maxillary sinuses in 29 patients (37.2%), while the lowest was the sphenoid sinus with 11 patients (14.1%).

Based on the results of the research data, it was found that the most anatomic variation was septal deviation of 24 people.

DISCUSSION

Sinusitis is one of the most common diseases that doctors encounter in primary health care. At present, radiological imaging is not only indicated to evaluate cases of uncomplicated sinusitis. Further diagnostic evaluation and radiological imaging must be performed for cases of sinusitis where symptoms persist or relapse.[4] Operators must have a systematic approach to review CT scans of the nose and paranasal sinuses for sinus disease, drainage pathways, anatomic variants, critical variants, and brain, neck, and orbital soft tissues.[5]

Anatomical variations and pathological processes in the nose and paranasal sinuses have been studied by experts. Many anatomical variations cause chronic sinus disease by causing obstruction in the ostiomeatal complex (OMC) and affecting the mucociliary transport pattern. Changes in the lateral wall of the nose and the turbinate media that stimulate changes in the mucosa and decrease the aeration of the paranasal sinuses and significantly increase the potential for sinus disease. Septal deviation is a common anatomical variation while double concha is a rare anatomical variation that was found.[6] CT scan of the paranasal sinus has become an obligation for all patients whose undergo surgery in the sinus cavity. In most patients, the ostiomeatal complex and the anterior ethmoids were involved (88%). Agger nasi cells (40%) are the most common anatomical variations followed by bullous and Haller concha cells (16%). Apart from this, nasal septum deviation was found in 44% of patients.[7]

In Aramani's study, it was found that 53.7% of cases of chronic sinusitis had two or more anatomical variations and 33.3% of cases had one anatomical variation. Septum deviation is found most often among other anatomic variations. The second most anatomical variation found is unilateral bullous concha.8 In the Delfitri's study, it was found that uncinate process abnormalities were the most commonly found anatomical variations (71.4%), and the most common uncinectomy was performed (77, 1%). Shepali's research found 52% of male and 48% of female. Researchers found many variants of the sinonasal cavity anatomy. The majority of patients in the study have at least one variant, which indicates that the presence of anatomic variants is very common in the paranasal sinus area. Maxillary sinus is the most frequently involved in 70% of cases, followed by the anterior ethmoid sinus (50.6%). Septal deviation is found in 77% of cases and is the most common variation followed by prominent agger nasi cells (42%).10 In the Julyanti's study the age range of 119 samples was obtained from 10-76 years with the highest age group at the age of 31-40 years namely 30 subjects (25.2%) and most were female with 69 cases (58%). The frequency of anatomical variations in 119 samples with chronic clinical rhinosinusitis symptoms found the most anatomical variations in the septal deviation of the rice as much as 80 (67.2%) and in the ethmoid bullae as many as 32 (26.9%) followed by 25 uncinate processes (21%), bullous concha as many as 15 (12.6%), Haller cells as many as 8 (6.7%), agger nasi cells as many as 7 (5.9%) and frontal cells as many as 5 (4.2%).[11]

CONCLUSION

Anatomic variations and pathological processes in the nose and paranasal sinuses have been studied by experts. Many anatomical variations cause chronic sinusitis by causing obstruction in the ostiomeatal complex (OMC) and affecting the mucociliary transport pattern. The most anatomical variation in this study is septal deviation.

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