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Original Research Article

Septoplasty and its Impact on Blood Pressure in Hypertensive Patients

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Abstract:

Background: Nasal septum is the bone and cartilage of the nose that separates the nasal cavity into two passages the space between the septum and the lateral walls of the nasal cavity regulates airflow and respiration. Nasal septum deviation is one of the most frequent reasons for nasal obstruction presented with a reduction in nasal airflow and chronic mucosal irritation. Abnormal upper airway resistance can play a role in the development of hypertension. Effective management of hypertension decreases the risk of, myocardial infarction, stroke, chronic kidney disease and heart failure.

Material and Methods: Adults of both sexes with age range from 20–40 years, suffering from symptomatic nasal septal deviation and newly detected hypertension (mean BP ≥140/90 mm Hg), undergoing submucosal resection (SMR) of the deviated septum, were included in the study. Preoperative evaluation was done and detailed history was take nasal septal deformities were classified according to the Dreher scale (0 = none i.e. no deviation, 1 = mild deviation i.e. deviation less than half of the total distance to the lateral wall, 2 = moderate deviation i.e. deviation greater than half of the total distance to the lateral wall but not touching it, 3 = severe deviation i.e. deviation touching the lateral wall). Compensatory inferior turbinate hypertrophy, when present, was noted. Hypertension was considered as controlled in patients who had a mean SBP <140 mm Hg and mean DBP <90 mm Hg on follow up, Patients in whom SBP was ≥140 mm Hg and/or DBP ≥90 mm Hg, were considered as uncontrolled hypertensive and they were started on medical treatment for hypertension. Postoperatively, patients were followed up after 1 month, 3 months and at the end of 1 year.

Conclusion: Patients with hypertension and deviated nasal septum, surgical correction is always indicated as it helps in reducing the blood pressure and thereby prevent cardio-pulmonary and cardiovascular complications secondary to hypertension.

Keywords: SMR, Hypertension, Hypertrophy.

Introduction

Cardiac complications due to upper airway obstruction (UAO) have been previously studied and reveal strong association between upper airway obstruction and heart rhythm disorders [1]. Factors that contribute to cardiovascular morbidity in individuals with UAO are enhanced oxidative stress, sympathetic nervous system activation, and exaggerated negative intrathoracic pressure swings [2]. One of the most common causes of upper airway obstruction is nasal septum deviation [3].

Nasal septum is the bone and cartilage of the nose that separates the nasal cavity into two passages the space between the septum and the lateral walls of the nasal cavity regulates airflow and respiration [4]. Nasal septum deviation is one of the most frequent reasons for nasal obstruction presented with a reduction in nasal airflow and chronic mucosal irritation. Abnormal upper airway resistance can play a role in the development of hypertension [5].

Hypertension is one of the major contributing factor to the current epidemic of cardiovascular disease in India and many other low- and middle- income countries [6]. Definition and classification of hypertension, specifies the threshold for defining high blood pressure (BP) as ≥140/90 mmHg [7]. Effective management of hypertension decreases the risk of, myocardial infarction, stroke, chronic kidney disease and heart failure [8].

Material and Methods

This prospective study was conducted in the Department of ENT at Darbhanga medical college and

Hospital Laheriasarai, Darbhanga Bihar. Approval of the Institute ethics committee was taken. Adults of both sexes with age range from 20– 40 years, suffering from symptomatic nasal septal deviation and newly detected hypertension (mean BP ≥140/90 mm Hg), undergoing submucosal resection (SMR) of the deviated septum, were included in the study. Written informed consent from all the participants was obtained. Patients having metabolic diseases, pregnant women, other nasal conditions, endocrine disorders, adenoid hypertrophy or enlarged tonsils, Body mass index ≥25, central obesity i.e. waist circumference greater than 90 cm in men and 80 cm in women, high dietary salt intake, low fruit and vegetable intake and sedentary lifestyle were excluded from the study. Preoperative evaluation was done and detailed history was take nasal septal deformities were classified according to the Dreher scale (0 = none i.e. no deviation, 1 = mild deviation i.e. deviation less than half of the total distance to the lateral wall, 2 = moderate deviation i.e. deviation greater than half of the total distance to the lateral wall but not touching it, 3 = severe deviation i.e. deviation touching the lateral wall).

Compensatory inferior turbinate hypertrophy, when present, was noted. Blood pressure {BP} was monitored while patient was in a rest using a standard mercury sphygmomanometer. Three readings of BP were taken at the interval of 10 minutes. SMR of the deviated nasal septum was performed in all cases. Hypertension was considered as controlled in patients who had a mean SBP <140 mm Hg and mean DBP <90 mm Hg on follow up, Patients in whom SBP was ≥140 mm Hg and/or DBP ≥90 mm Hg, were considered as uncontrolled hypertensive and they were started on medical treatment for hypertension. Postoperatively, patients were followed up after 1 month, 3 months and at the end of 1 year. On each of these visits, general and ENT examination were carried out and BP was recorded on three occasions.

Results

Of the 50 patients included in the study 40 (80%) were male and 10(20%) were female. Mean age was 34 ± 4.56.

Table 1: Characteristics of the study group

Characteristics	n=50	%
Male	40	80%
Female	10	10%
Mean age	34 ± 4.56	

Table 2: Septal deviation gradation

Grade	N=50	%
Mild	10	20%
Moderate	31	62%
Severe	9	18%
Compensatory hypertrophy	11	22%

Mild septal deviation was seen in 10(20%), moderate septal deviation was observed in 31 (62%) and severe septal deviation was seen in 9 (18%). Compensatory hypertrophy was observed in 11(22%) of cases. Mean preoperative SBP was 143.76 ± 2.78 mm Hg and mean DBP was 93 ± 1.55 mm Hg. Hypertension was controlled in 70 % of patients who showed a strongly significant ($P < 0.001$) decrease in BP about 10–12 mm Hg decrease in SBP and 4–5 mm Hg decrease in DBP.

Mean SBP on first follow up after one month was 141.36 ±3.45 mm Hg and mean DBP was 92.4 ± 1.09 mm Hg. Mean SBP after three month was 135.36 ±2.78 mm Hg and mean DBP was 85.4 ± 1.11 mm Hg. Mean SBP after one year of follow-up was128.74 ± 2.71 mm Hg and mean DBP was 83.2 ± 1.23 mm Hg A statistically significant association ($P < 0.001$) was seen between type of nasal septal deviation and response of BP to septal correction. In 35 (70%) of the cases SBP and DBP was controlled after one year of follow up.

Discussion

Deviated nasal septum with nasal obstruction has profound effects on the body, and the physiological ventilation of the lung gets disrupted by obstructing airflow, due to this there is reduction in the oxygenation in the lungs and causes an increased respiratory and heart rate. Mechanical upper airway obstruction with nasal septal deviation can lead to hypoxia, and significant changes in intrathoracic pressure.

All these factors may affect sympathetic, parasympathetic activation and may also affect cardiac autonomic responses. Patients with deviated nasal septum patients can be predisposed to several pulmonary and cardiovascular disorders [9]. Studies have shown a high prevalence of hypertension in India. Early Detection and proper management of hypertension decreases the risk of stroke, myocardial infarction, chronic kidney disease and heart failure [10]. In our study SMR has been shown to be effective in reducing nasal resistance in patients with

uncomplicated deviated nasal septum. Same findings were observed in other study [11]. In our study 35 (70%) of the cases SBP and DBP were controlled after one year of follow up. Mean SBP after one year of follow-up was 128.74 ± 2.71 mm Hg and mean DBP was 83.2 ± 1.23 mm Hg. Yurit as et al. observed that Autonomic dysfunction that occurred due to nasal septal deviation was found to decrease after surgical correction of the deviated septum [12]. Garcia et al. observed that the posterior nasal cavity can accommodate significant septal deviations without a substantial increase in airway resistance [13].Stamler et al. demonstrated a positive relationship between age and systolic pressure and concluded that increase in BP was seen in older subjects [14].

Conclusion

Patients with hypertension and deviated nasal septum, surgical correction is always indicated as it can reduce the blood pressure and thereby prevent cardio-pulmonary and cardiovascular complications secondary to hypertension.

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