



Nasal Septal Deviation Among Patients With and Without Obstructive Sleep Apnea: A Pilot Study



Kram, Yoseph A., MD, Zaghi, Soroush, MD, Fernandez-Salvador, Camilo MD, Kushida, Clete A., MD, PhD Camacho, Macario, MD
Tripler Army Medical Center Otolaryngology

Introduction

Deviated nasal septums are common even when without nasal obstruction and may be caused by external traumatic forces fracturing the septum. Obstructive Sleep Apnea (OSA) patients often have high arched palates, and as this nasal floor elevates, it may bend the septal cartilage to create a deviation. This study's objective was to determine if there is a higher frequency or severity of septal deviations in patients with OSA.

Methods and Materials

This is a retrospective chart review. Inclusion criteria: (1) patients in the Stanford sleep medicine clinic with or without OSA (i.e. restless leg syndrome, narcolepsy, periodic limb movements of sleep, parasomnia) and (2) nasal examination performed during the clinic visit. Exclusion criteria: (1) prior nasal surgery; and (2) prior nasal trauma. The nasal septum was classified as grade 1: no to minimal deflection from the midline, grade 2: mild nasal septal deviation, grade 3: moderate nasal septal deviation and grade 4: severe nasal septal deviation based on a previously published objective classification.

Results

250 patients underwent nasal examination, and 67 adults, age 53.5±17.8 years and body mass index 28.2±6.0 kg/m², met inclusion criteria. 43.1% (25/58) of patients with OSA and 33% (3/9) of patients without OSA had a nasal septal deviation, respectively. Results are shown in the tables below. Pearson's Chi-square test of independence was used to assess the relationship between nasal septal deviation frequency and OSA severity, with resulting p-value of 0.0673. An overall summary of contingency analysis of nasal septal deviations based on OSA severity is shown in the below mosaic plot.

Characteristics	
Age in years	53.5 ±17.8
Male Gender (%)	67%
BMI (kg/m ²)	28.2 ± 6.0
OSA Severity	
No OSA	N=9
Mild OSA	N=17
Moderate OSA	N=17
Severe OSA	N=24
Septal Deviation	
No Deviation	N=39
Mild Deviation	N=20
Mod Deviation	N=5
Severe Deviation	N=3
Ethnicity	
Black (N=4)	5.90%
Asian (N=9)	13.40%
Indian (N=6)	9.00%
Latino (N=6)	9.00%
Caucasian (N=42)	62.70%

OSA Severity	Nasal deviation	Number patients	Percent patients
Severe OSA	Severe	3/24	12.50%
	Mod	1/24	4.20%
	Mild	7/24	29.20%
	None	13/24	54.20%
Severe total		N=24	
Moderate OSA	Severe	0/17	0%
	Mod	0/17	0%
	Mild	4/17	23.50%
	None	13/17	76.50%
Moderate total		N=17	
Mild OSA	Severe	0/17	0%
	Mod	4/17	23.50%
	Mild	6/17	35.30%
	None	7/17	41.20%
Mild total		N=17	
No OSA	Severe	0/9	0%
	Mod	0/9	0%
	Mild	3/9	33.30%
	None	6/9	66.70%
No OSA total		N=9	

		Septal Deviation				
OSA Severity	Count	None	Mild	Mod	Severe	Total
	Col % Row %					
None	6	15.4	15	0	0	9
		66.7	33.3	0	0	
Mild	7	18.0	30	4	0	17
		41.2	35.3	23.5	0	
Mod	13	33.3	20	0	0	17
		76.5	23.5	0	0	
Severe	13	33.3	35	20	100	24
		54.2	29.2	4.2	12.5	
Total		39	20	5	3	67

Discussion

These findings are consistent with the hypothesis that OSA is associated with nasal septal deviations. We describe both the septal deviation grade and also OSA severity. Nasal surgery can improve positive airway pressure device use and lower pressures required.⁵ Many patients were excluded because of a lack of a sleep study with resultant n=67, leading to a relatively low sample size in the non-OSA group. We recommend that future research report septal deviation and OSA severity. This pilot study found a trend toward statistical significance with p-value = 0.0673 in correlating OSA severity to nasal septal deviation severity. A larger sample size may have lead to statistical significance.

Test	Chi Square	Prob >ChiSq
Likelihood Ratio	16.63	0.0548
Pearson	15.981	0.0673

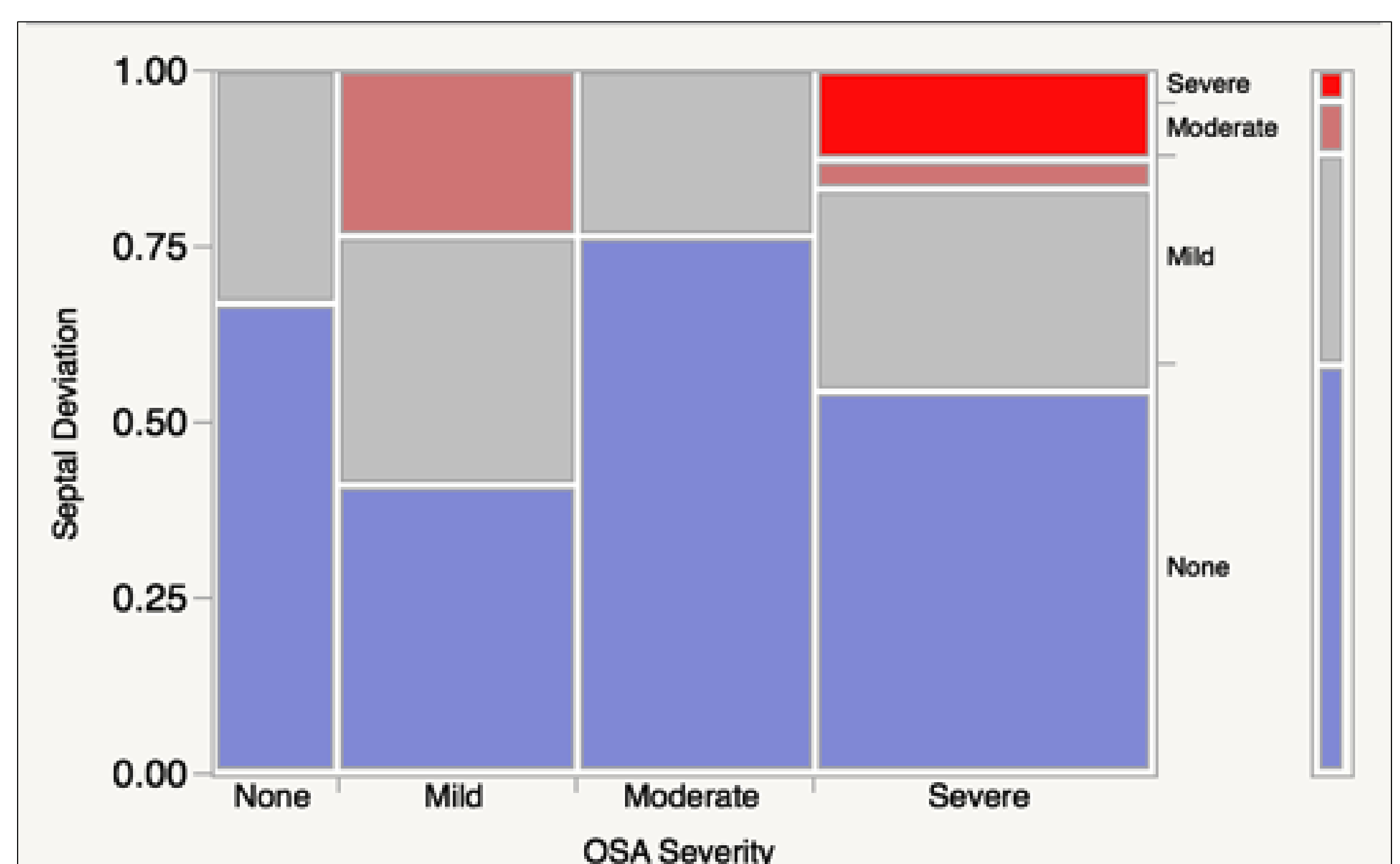


Figure 1. Contingency Analysis of Septal Deviation by OSA severity Mosaic Plot

Conclusion

In this preliminary study of patients without nasal surgery or nasal trauma, the frequency of nasal septal deviations was higher amongst patients with OSA compared to those without OSA. There was a trend of correlation between OSA severity and septal deviation severity with an overall p=.0673.

Disclosures

There are no disclosures or financial interests. The views expressed in this presentation are those of the authors and do not reflect the official policy or position of the Department of the Army, Department of Defense, or the US Government.

Contact

Yoseph A Kram, MD
Tripler Army Medical Center
Email: Yoseph.Kram@gmail.com
Phone: 808-433-3181

References

1. Camacho M, Riaz M, Capasso R, Ruoff CM, Guilleminault C, Kushida CA, et al. The effect of nasal surgery on continuous positive airway pressure device use and therapeutic treatment pressures: a systematic review and meta-analysis. *Sleep* 2015;38:279-86