

# Benign Paroxysmal Positional Vertigo: A Rare Complication of Orthognathic Surgery

## Case Report

*Haitham Attia*

*Oral and Maxillofacial Surgery, Faculty of Dentistry, King Abdulaziz University,, Kingdom of Saudi Arabia*

## ABSTRACT

Benign paroxysmal positional vertigo (BPPV) is a rare complication of Le Fort I osteotomy of labyrinthine origin, usually characterized by brief recurrent episodes of vertigo. Head trauma accounts for the large percent of (BPPV). Surgical mallet and osteotomes used in pterygoid osteotomy induce trauma, which can displace otoliths into the semicircular canal leading to incapacitant symptoms. Diagnoses can be confirmed through history and physical examination, including positive Dix–Hallpike test. In This article a Benign paroxysmal positional vertigo case is presented. Management of the case through collaborative assessment process, planning, care coordination, and proper treatment was provided. Awareness of a rare complication such as BPPV is of utmost importance when patients complain of dizziness following orthognathic surgery.

**Key Words:** Orthognathic surgery, Benign Paroxysmal Positional Vertigo (BPPV), Dix–Hallpike test.

**Received:** 26 September 2021, **Accepted:** 18 January 2021 .

**Corresponding Author:** Haitham Attia , Accociate Professor at Oral and Maxillofacial Surgery, Faculty of Dentistry, King Abdulaziz University, Kingdom of Saudi Arabia, **Tel :** 0227057568, **Mobile:** 00966545828601, **E-mail:** haithamattia75@yahoo.com

**ISSN:** 2090-097X, July 2021, Vol. 12, No. 3

## INTRODUCTION

Dentofacial deformities is corrected by orthognathic surgery. Principles of orthognathic surgery are based on manipulation of the maxilla or/and mandible to a favourable position that contributes to better function and aesthetics. Orthognathic surgery is indicated when certain implications are not met by orthodontic techniques<sup>[1]</sup>. Le Fort I osteotomy is used for correction of midface deformities. Surgical mallet and osteotomes are main armamentarium, used in conjunction with other equipment in performing Le Fort I osteotomy, that may predispose to head trauma directed mainly to the sphenoid bone with development of vertigo<sup>[2]</sup>.

Benign paroxysmal positional vertigo (BPPV) is a rare complication of orthognathic surgery of labyrinthine origin. Trauma to the head is a leading cause accounting for 1520%- of all cases<sup>[3]</sup>. Anatomically it arises from utricle through otoconia that moves to the semicircular canal causing brief episodes of vertigo when changing the position of the head. Self-limiting in nature could take 3 to 4 weeks to resolve or may take 3 months without treatment.

May occur unilateral or bilateral<sup>[4]</sup>.

## CASE REPORT

A 28-year-old man who had an orthognathic surgery 10 days ago (Le Fort I and malar reduction combined with bilateral sagittal split osteotomy) complaining from vertigo for 6 days of duration. The patient was referred to an otolaryngologist. Patient reported no vertigo on rest, but vertigo developed upon changing position or moving his head, loss of balance, dizziness and nausea.

For physical examination, patient was asked to sit in upright position on an examination couch and bend over for 20 seconds and then get back to the upright position, lie on his back over the examination couch. While patient is in supine position, he was asked to turn over from right side to left side and get back to upright position again. Nystagmus was unilateral (asymmetric).

Dix–Hallpike test triggered unilateral vertigo and geotropic rotational nystagmus at the same time as upbeat

nystagmus. No abnormal findings on further neurological examination. Epley's manoeuvre on the right side was used to treat the patient on the first day of presentation. After 24 hours patient became better, slight dizzy had no vertigo and no nystagmus. Follow up after a month showed patient was well and no recurrence of BPPV.

## DISCUSSION

BPPV is defined as an abnormal sensation of motion that is triggered by certain stimulating positions such as changing position, which trigger specific eye movements (ie, nystagmus)<sup>[2]</sup>.

Nystagmus is defined as involuntary eye movements usually provoked by inner ear stimulation. It starts slow followed by a fast movement, rapid resetting phase. Nystagmus may be termed right or left beating, up or down beating or rotational based on the direction of the fast phase. Rotational nystagmus can be clockwise and anticlockwise or geotropic and ageotropic. Geotropic means "toward earth" upper half of the eye and Ageotropic refers to lower half of the eye<sup>[4]</sup>.

BPPV is characterized by a sudden onset. Most of patients when they wake up, try to sit upright they notice dizziness and vertigo. Symptoms varies, as in severe cases a slight change in head position may provoke nausea and vomiting, but at rest patient could have few or no symptoms<sup>[5]</sup>. Condition may last for few days to weeks; however, symptoms occasionally resolve and recur. By far, authors reported that BPPV is a self-limiting and fade without treatment. A study conducted by Beshkar et al, in 2013 reported a 2% BPPV case occurred in orthognathic patients<sup>[6]</sup>. A 3% BPPV was reported by Sammartino et al. using a mallet and osteotomes in le fort I osteotomy<sup>[7]</sup>. Saker et al, explained the occurrence of BPPV in orthognathic surgery as the maxilla is close to the ear and the vestibular system, with forces being transmitted through the osteotome and possibility of otoconia dislodgment<sup>[8]</sup>.

BPPV is diagnosed using a clinical manoeuvre known as Dix-Hallpike test. The patient is moved rapidly from an upright position to a supine position with the head angled 45o to affected side (right) after 20 seconds the patient returned to the sitting position. The procedure is repeated to the left side if no nystagmus on the right side<sup>[9]</sup>. A pathognomonic indication is the presence of rotary nystagmus characterized by latency and limited duration. A negative test indicates no presence of active canalithiasis. Our patient was treated with Epley's manoeuvre, and no recurrence was reported<sup>[10]</sup>.

## CONCLUSION

Awareness of benign paroxysmal positional vertigo as a feasible complication of orthognathic surgery is of utmost importance. The main cause behind this complication following orthognathic surgery; is the force transmission, using osteotome, through the intervening bones to the inner ear, causing vertigo. Patients complaining

from vertigo following orthognathic surgery should be considered for BPPV. Using piezoelectric surgery or straight osteotome with twist technique may reduce the risk of BPPV. The separation between the maxillary segment and pterygoid plates could be performed safely by proper attention and controlling of the force.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

## REFERENCES

- 1- Gordon CR, Levite R, Joffe V, Gadoth N. Is posttraumatic benign paroxysmal positional vertigo different from the idiopathic form? *Arch Neurol* 2004; 61:1590–3.
- 2- Soto-Varela A, Rossi-Izquierdo M, Santos-Peréz S. Benign paroxysmal positional vertigo simultaneously affecting several canals: a 46-patient series. *Eur Arch Otorhinolaryngol* 2013; 270:817–22.
- 3- Koc EA, Koc B, Eryaman E, Ozluoglu LN. Benign paroxysmal positional vertigo following septorhinoplasty. *J Craniofac Surg* 2013; 24: e89–90.
- 4- Garg S, Kaur S. Evaluation of post-operative complication rate of Le Fort I osteotomy: a retrospective and prospective study. *J Maxillofac Oral Surg* 2014; 13:120–7.
- 5- Park SK, Kim SY, Han KH, Hong SK, Kim JS, Koo JW. Benign paroxysmal positional vertigo after surgical drilling of the temporal bone. *Otol Neurotol* 2013; 34:1448–55.
- 6- Beshkar M, Hasheminasab M, Mohammadi F. Benign paroxysmal positional vertigo as a complication of orthognathic surgery. *J Craniomaxillofac Surg* 2013; 41:59–61.
- 7- Imai T, Ito M, Takeda N, et al. Natural course of the remission of vertigo in patients with benign paroxysmal positional vertigo. *Neurology* 2005; 64:920–1.
- 8- Sammartino G, Mariniello M, Scaravilli MS. Benign paroxysmal positional vertigo following closed sinus floor elevation procedure: mallet osteotomes vs. screwable osteotomes. A triple blind randomized controlled trial. *Clin Oral Implants Res* 2011; 22:669–72.
- 9- Saker M, Ogle O. Benign paroxysmal positional vertigo subsequent to sinus lift via closed technique. *J Oral Maxillofac Surg* 2005; 63:1385–7.
- 10- Khattak ZG, Benington PC, Khambay BS, Green L, Walker F, Ayoub AF: An assessment of the quality of care provided to orthognathic surgery patients through a multidisciplinary clinic. *J Craniomaxillofac Surg* 40: 243e247, 2012.