

Introduction

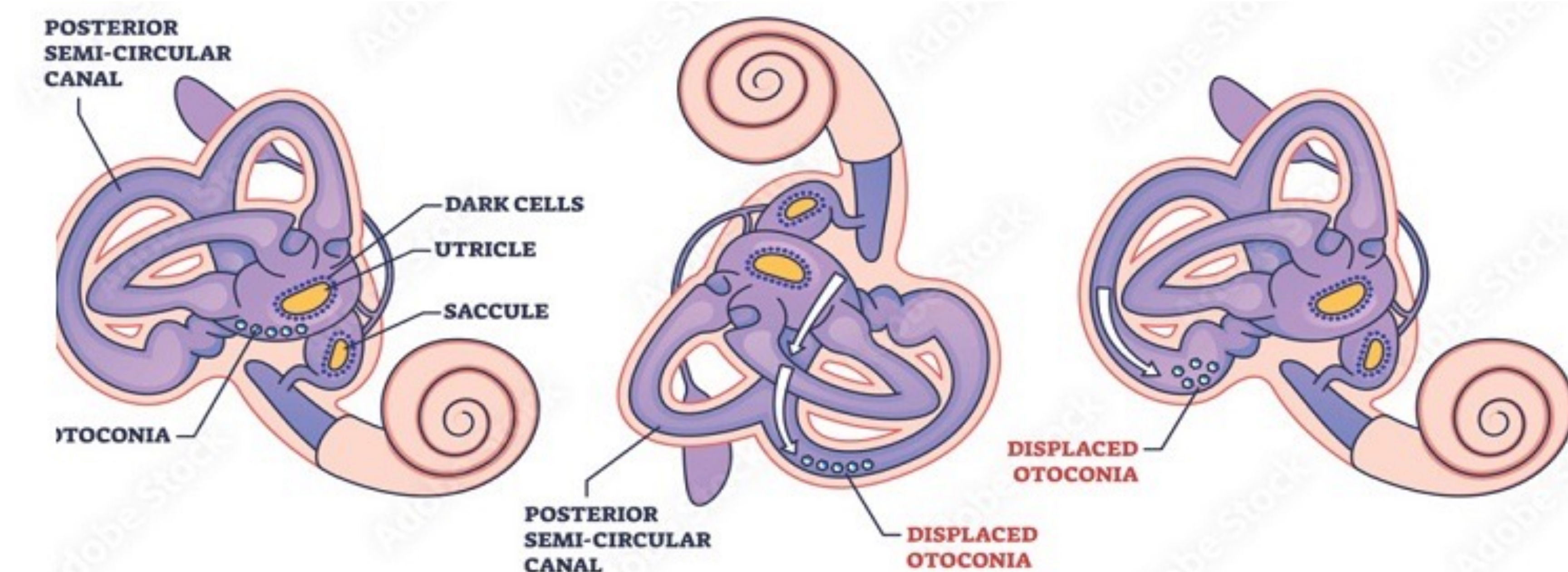
Benign paroxysmal positional vertigo (BPPV) is a vestibular disorder causing brief vertigo episodes triggered by head movements. Rarely, it may result from dental and maxillofacial surgeries, where high-frequency tools, percussive forces, and neck hyperextension disrupt inner ear structures like otoliths. This study reviews the pathophysiology, symptoms, and treatment of iatrogenic BPPV based on the literature, emphasizing timely diagnosis, effective management, and prevention.

Methodology

This review explored evidence on BPPV as a complication of dental and maxillofacial surgeries. Searches in Google Scholar, PubMed, and the Journal of Oral and Maxillofacial Surgery (2005–2020) up to 2,564th result identified eight relevant studies, including case reports and reviews. It analyzed BPPV onset, diagnosis, and management following procedures like sinus floor elevation, implant placement, third molar extractions, and orthognathic surgery, highlighting surgical trauma, osteotome use, prolonged head positioning, and pre-existing vestibular issues as contributors.

Pathophysiology of BPPV in Dental and Maxillofacial

Dental and maxillofacial surgeries can trigger BPPV through vibrations or mechanical trauma affecting the inner ear. Chiarella et al. (2007) found that tools like rotating instruments, hammers, and chisels generate vibrations that dislodge otoliths, causing macular trauma and otoconial separation. Vestibular pathology was observed on the treated side, with onset 8 hours to 7 days post-surgery, most commonly involving the posterior semicircular canal. Petrocelli et al. (2020) further linked instruments like osteotomes and mallets to postoperative BPPV. In their study of 21 cases, vestibular pathology appeared an average of 3.61 days post-surgery, with all patients responding well to canalith repositioning procedures, such as the Epley maneuver.



<https://www.nolanhillphysiotherapy.ca/blog/bppv-treatments/physiotherapy-interventions-for-bppv-in-older/>

BPPV and Dental Implant Procedures

Dental implant procedures, especially simultaneous with osteotome sinus floor elevation (OSFE), have been linked to BPPV. Case studies have shown BPPV developing immediately after such procedures, with surgical trauma, neck hyperextension, and percussive forces contributing to otolith displacement. The posterior semicircular canal's proximity to maxillary surgical sites increases susceptibility to these forces. Even implant removal using piezosurgical tools can cause BPPV due to vibrations dislodging otoconia. Minor trauma from surgical hammering also poses a risk.

Sinus Lift Procedures and BPPV

Sinus lift surgeries can trigger BPPV due to prolonged neck hyperextension or head positioning, even without direct mechanical trauma. Reddy et al. (2015) documented cases of BPPV developing from positional changes alone. Saker et al. (2005) reported a 3% incidence of BPPV in sinus floor elevation patients, highlighting the need for careful surgical techniques and patient positioning to minimize risk due to close proximity of the surgical site to the inner ear.

Orthognathic Surgery and BPPV

Orthognathic surgeries, particularly maxillary Le Fort osteotomies, can cause BPPV. A study by Beshkar et al. (2013) found one case of BPPV in 50 orthognathic surgery patients. The condition results from mechanical forces transmitted to the inner ear, dislodging otoliths. While usually self-limiting, BPPV requires further monitoring and appropriate treatment such as Dix-Hallpike test and Epley maneuver.

Management and Treatment of BPPV

To minimize BPPV risk in oral surgeries:

1. Optimize surgical techniques: Reduce vibrations and percussive forces during procedures like OSFE and sinus lifts.
2. Maintain neutral head positions: Avoid prolonged or hyperextended positioning.
3. Educate patients: Inform about potential post-surgery BPPV symptoms.
4. Conduct preoperative assessments: Screen for preexisting vestibular disorders.

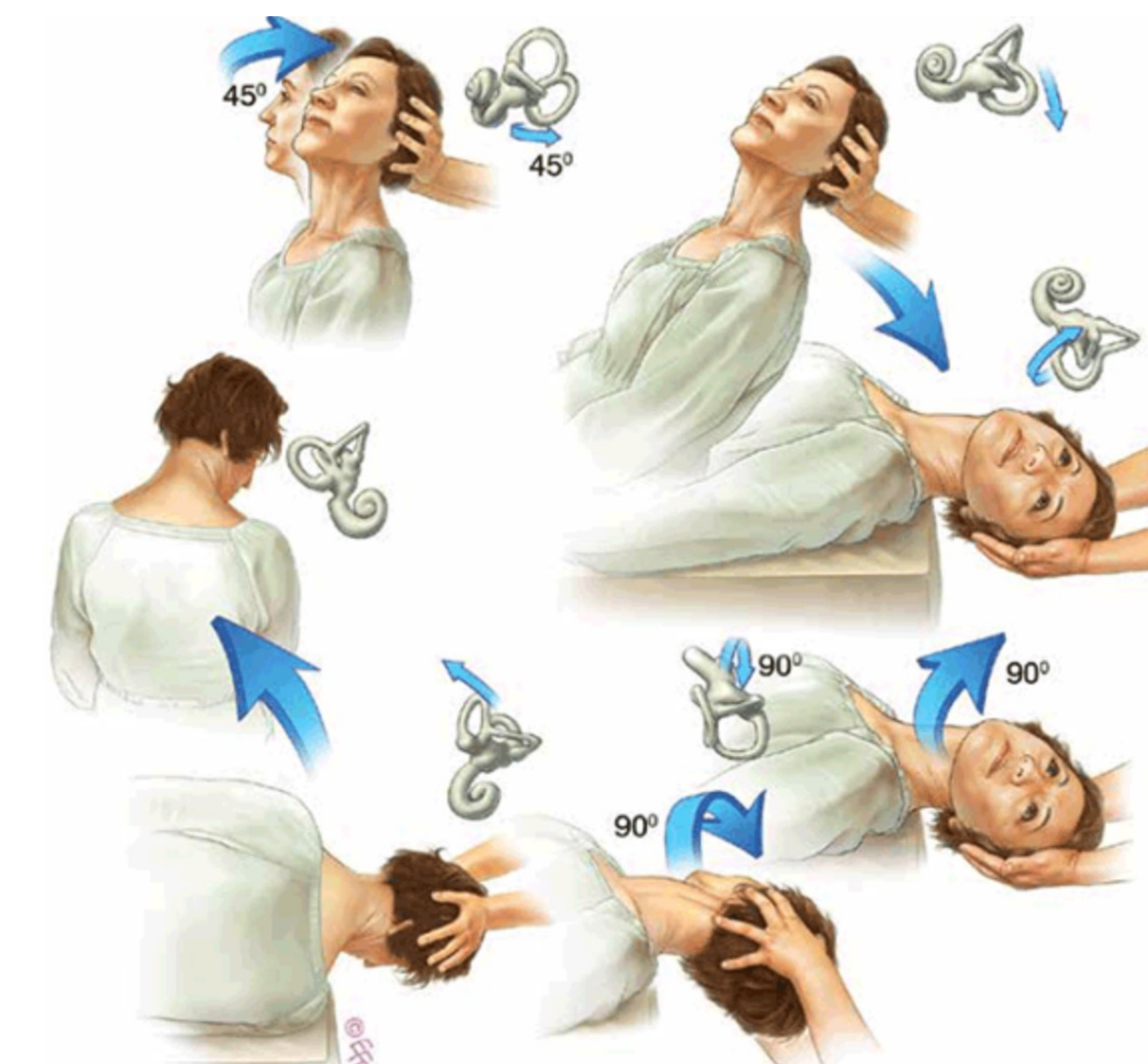


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Treatment approaches for BPPV in oral surgery patients:

1. Canalith repositioning procedures (CRPs): First-line treatment, including Epley and Semont maneuvers.
 2. Brandt-Daroff exercises: Home-based habituation exercises.
 3. Pharmacological interventions: Antihistamines and benzodiazepines for acute symptom relief (use cautiously).
 4. Vestibular rehabilitation therapy: For persistent balance issues or CRP-resistant cases.
 5. Watchful waiting: For mild cases with minimal discomfort.
- These strategies address both prevention and treatment of BPPV in oral surgery patients.



<https://www.racgp.org.au/afp/2013/january-february/the-epley-manoevre>

Conclusion

BPPV is a rare but significant complication of dental and maxillofacial surgeries. Surgical trauma, vibrations, and head positioning can dislodge otoliths, causing vertigo. Prompt diagnosis and treatment are crucial. Surgeons can reduce BPPV risk by minimizing vibrations, maintaining neutral head positions, and using careful techniques, thus improving patient outcomes.

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