

## ORIGINAL RESEARCH

### Incidence of altered sensation after mandibular premolar and molar periapical surgery

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#### ABSTRACT:

**Backgrounds:** Altered sensation due to a nerve injury is an infrequent and severe complication of endodontic treatments. Altered sensation following endodontic treatment may result in liability claims. Hence; the present study was undertaken for assessing the incidence of altered sensation after mandibular premolar and molar peri-apical surgery. **Materials & methods:** A total 50 patients were enrolled in the present study that was scheduled to undergo peri-apical surgeries involving mandibular premolar or molar. All the surgeries were performed under the hands of skilled and experienced Endodontists. Patients were given a postoperative instruction sheet. Patients were informed of the possibility of altered sensation and advised to contact the clinic in case of untoward event. Incidence of altered sensation was recorded and analysed. **Results:** The overall incidence of altered sensation was found to be 22 percent (11 patients). Out of 26 cases of mandibular premolar involvement, altered sensation occurred in 34.62 percent of the cases. Out of 24 cases of mandibular molar involvement, altered sensation occurred in 8.33 percent of the cases. Incidence of altered sensation was significantly higher among patients undergoing peri-apical surgery involving mandibular premolar in comparison to mandibular molar. **Conclusion:** Peri-apical surgeries in the mandibular arch are significantly associated with altered sensation, particularly in mandibular premolars in comparison to mandibular molars.

**Key words:** Altered sensation, Mandibular, Peri-apical surgery

Received: 13 Jan, 2020

Revised: 29 Jan, 2020

Accepted: 30 Jan, 2020

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**This article may be cited as:** Chiragbhai PK, Patel SM, Ghadia AH, El Seblani D. Incidence of altered sensation after mandibular premolar and molar periapical surgery. Int J Res Health Allied Sci 2020; 6(1):45-47.

#### INTRODUCTION

Altered sensation due to a nerve injury is an infrequent and severe complication of endodontic treatments. Practically all endodontic procedures, such as local anesthesia administration, root canal preparation and irrigation, root canal filling, and surgical endodontic treatments that are performed in the vicinity of trigeminal nerve branches may trigger nerve injury. Many non-endodontic-related entities such as infectious diseases, trauma, tumors, or idiopathic diseases have also been suggested as possible origins of altered sensation of trigeminal nerve branches, and should be regarded as a

differential diagnosis for endodontic treatment related nerve injury.<sup>1-3</sup>

Nerve injuries, including injuries of the inferior alveolar nerve (IAN), represent a rare but serious complication of dental treatment. Trauma, tumors, connective tissue diseases, infectious diseases, demineralization, or idiopathic diseases have been reported as possible causes of paresthesia of the IAN. Paraesthesia is a classical sensory response resulting from neuropraxia and is defined as 'a burning or prickling sensation or partial numbness caused by neural injury. Patients have described it variously as warmth, cold, burning, aching, prickling, tingling,

pins and needles, numbness, and formication (itching in the absence of stimuli). Endodontic malpractice claims have been previously reported and they represent a common malpractice claim in dentistry. Altered sensation following endodontic treatment may result in liability claims.<sup>4-6</sup> Hence; the present study was undertaken for assessing the incidence of altered sensation after mandibular premolar and molar periapical surgery.

**MATERIALS & METHODS**

The present study was conducted with the aim of assessing the incidence of altered sensation after mandibular premolar and molar peri-apical surgery. Ethical approval was obtained before the starting of the study and written consent was obtained from the entire patient after explaining in detail the entire research protocol. A total 50 patients were enrolled in the present study that was scheduled to undergo peri-apical surgeries involving mandibular premolar or molar. All the surgeries were performed under the hands of skilled and experienced Endodontists. Exclusion criteria for the present study included:

- Patients with history of any other systemic illness,
- Patients with any known drug allergy,
- Hypertensive and diabetic patients,
- Patients with history of any bone metabolic disorder

Patients were given a postoperative instruction sheet. Patients were informed of the possibility of altered sensation and advised to contact the clinic in case of untoward event. Incidence of altered sensation was recorded and analysed. All results were recorded in Microsoft excel sheet and were analysed by SPSS software. Chi- square test was used for assessment of level of significance.

**RESULTS**

In the present study, a total of 50 patients were analysed who underwent peri-apical surgeries. Mean age of the patients was found to be 23.8 years. 38 percent of the patients belonged to the age group of less than 25 years. 30 percent of the patients belonged to the age group of 25 to 40 years. 32 percent of the patients belonged to the age group of more than 40 years. 76 percent of the patients were males while the remaining were females. In 52 percent of the patients, peri-apical surgery of mandibular premolar was done while in the remaining 48 percent of the patients, peri-apical surgery of the mandibular molar was done. In the present study, the overall incidence of altered sensation was found to be 22 percent (11 patients). Out of 26 cases of mandibular premolar involvement, altered sensation occurred in 34.62 percent of the cases. Out of 24 cases of mandibular molar involvement, altered sensation occurred in 8.33 percent of the cases. Incidence of altered sensation was significantly higher among patients undergoing

peri-apical surgery involving mandibular premolar in comparison to mandibular molar.

**Table 1:** Demographic and clinical data

Parameter	N	%	
Age group (years)	Less than 25	19	38
	25 to 40	15	30
	More than 40	16	32
Gender	Males	38	76
	Females	12	24
Tooth	Mandibular premolar	26	52
	Mandibular molar	24	48

**Table 2:** Incidence of altered sensation

Parameter	Number of patients with altered sensation	Percentage of patients	p- value
Mandibular premolar (n= 26)	9	34.62	0.00 (Significant)
Mandibular molar (n= 24)	2	8.33	
Overall (n= 50)	11	22	-

**DISCUSSION**

Sensory disturbances such as paresthesia, anesthesia, hypoesthesia and hyperesthesia may occur in the oral cavity. Paresthesia is defined as a burning or prickling sensation or partial numbness caused by neural injury. Patients have described it as warmth, cold, burning, aching, prickling, tingling, pins and needles, numbness and formication (itching in the absence of stimuli). In dentistry, paresthesia can be caused by systemic or local factors. Multiple sclerosis, sarcoidosis, metastasis, viral and bacterial infections, leukemia and lymphoma are some of the systemic disorders that may cause orofacial paresthesia. Local factors include traumatic injuries, such as mandibular fractures, expanding compressive lesions (benign or malignant neoplasia and cysts), impacted teeth, local infections (osteomyelitis, periapical and peri-implant infections), iatrogenic lesions after tooth extractions, anesthetic injection, endodontic therapy (overfilling and apical surgery), implantology, orthodontic surgery and preprosthetic surgery.<sup>7,8</sup>

Inferior alveolar and mental nerve injuries have been frequently reported in second mandibular molars and mandibular premolars, but also in other mandibular teeth. Nerve injuries were also often reported following local anesthetic administration for endodontic treatment purposes.<sup>8</sup> Hence; the present study was undertaken for assessing the incidence of altered sensation after mandibular premolar and molar periapical surgery.

In the present study, a total of 50 patients were analysed who underwent peri-apical surgeries. Mean

age of the patients was found to be 23.8 years. 38 percent of the patients belonged to the age group of less than 25 years. 30 percent of the patients belonged to the age group of 25 to 40 years. 32 percent of the patients belonged to the age group of more than 40 years. 76 percent of the patients were males while the remaining were females. In 52 percent of the patients, peri-apical surgery of mandibular premolar was done while in the remaining 48 percent of the patients, peri-apical surgery of the mandibular molar was done. Chaushu G et al conducted a retrospective analysis of all liability claims related to persistent altered sensation following placement of mandibular implants reported to the Medical Consultants International (MCI) Company from 1992 to 1999. Reports related to persistent altered mandibular sensation in 16 patients (12 women and 4 men) who underwent implant surgery in Israel were examined. The MCI files were retrospectively evaluated according to a structured form. The parameters studied included patient age and gender, implant location and length, imaging modality, and the time between actual damage and filing of a claim (ie, letter of demand or lawsuit). The time in months between actual damage and filing of claim ranged from 0 to 60 months (mean 21.5 months). No cases were found involving transient changes in sensation. The female/male ratio was 3:1. Implant length was equal to or longer than 13 mm in 6 of 7 implants placed in the molar region. In the premolar area, nerve injury was evident in 6 of 7 cases where implants shorter than 12 mm were used. Transient nerve injury rarely results in legal action. Maximum effort should be devoted to accurately determining the appropriate implant length in the mandible.<sup>9</sup>

In the present study, the overall incidence of altered sensation was found to be 22 percent (11 patients). Out of 26 cases of mandibular premolar involvement, altered sensation occurred in 34.62 percent of the cases. Out of 24 cases of mandibular molar involvement, altered sensation occurred in 8.33 percent of the cases. Incidence of altered sensation was significantly higher among patients undergoing peri-apical surgery involving mandibular premolar in comparison to mandibular molar. Mainkar A et al determined the incidence of altered sensation after periapical surgery procedures in mandibular premolars and molars. This retrospective study includes patients who received periapical surgery in endodontic clinics of a university hospital in the United States. Data were obtained by review of the records for patients who met the inclusion criteria, and statistical analysis of possible predictive factors was performed using the 2-tailed Fisher exact test ( $\alpha = 0.05$ ). Sixty-two patients (63 teeth, 13 premolars and 50 molars) met the inclusion and exclusion criteria

and were analyzed in the study. The first follow-up visit occurred 3 to 37 days after surgery. Altered sensation was observed in 9 patients. Observation of altered sensation was significantly higher (odds ratio = 7.19) after premolar surgeries (5/13) compared with molar surgeries (4/50). Despite the limited size and retrospective nature of their study, it was concluded that the incidence of altered sensation after periapical surgery appears to be relatively high (14%), with a higher incidence found in premolars compared with molars.<sup>10</sup>

## CONCLUSION

From the above results the authors concluded periapical surgeries in the mandibular arch are significantly associated with altered sensation, particularly in mandibular premolars in comparison to mandibular molars.

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