

Incidence of inflammation in completely impacted lower third molars

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Abstract

The influence of ageing and the contact of the adjacent tooth on purulent inflammation associated with the completely impacted lower third molar was assessed in 26 patients with clinical symptoms of infection out of 800 patients who had roentgenographically-confirmed completely impacted lower third molars. These 26 patients were 23 years of age or older. The 9 with pain alone ranged from 25 to 44 years of age, whereas the 17 patients with inflammation ranged from 29 to 67 years of age, and non-contact to adjacent tooth was associated with purulent inflammation in older patients, indicating completely impacted lower third molars may cause pain only until 45 years of age; but purulent inflammation occurs even in the group of non-contact to adjacent tooth after 45 years of age. The authors recommend that a completely impacted lower third molar should be removed if the risk factors of advanced age and contact with the adjacent tooth are present.

Key words: Third molars, impacted teeth, inflammation, mandible.

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Introduction

There is a wide range of opinions among general dental practitioners regarding whether it is necessary to remove asymptomatic mandibular third molars.¹ Huang and Mercier² recommended that asymptomatic impacted teeth be left in place in order to preserve the integrity of the covering tissue, while Ventä³ recommended the early removal of impacted third molars because of the increased risk of later complications. The risk of infection is a consideration

in both lines of thinking. Indeed, purulent infection is seen even in completely impacted lower third molars in adults. However, the aetiology and risk factors for inflammation have not been studied in completely impacted teeth, even though they are important factors in the prevention and treatment of pericoronitis.

The purpose of this study was to examine the effects of age and contact with the adjacent tooth on inflammation of the completely impacted lower third molar using a roentgenographic and clinical survey of cases.

Materials and methods

Eight hundred and twenty four dental radiographs (414 in females and 410 in males) from a total of 800 patients (average, 1.03 films/patient) aged 23 years or more (mean age: 34.8 ± 10.7 years, range 23-83 years) were studied. All of the patients had lower third molars completely covered by healthy bone and had sought consultation and care between April 1989 and March 1991. The patients were in good general health, and no patient was taking any medication. Patients with follicular or dentigerous cysts, odontomas, traumatic injury, neuralgia, over-eruption of the upper third molar, or incomplete root development were excluded from this study.

The incidence of pain or purulent inflammation involving the completely impacted lower third molar was determined in each of five age groups in the 800 patients. Pain was defined as pain upon palpation or spontaneous pain, and purulent inflammation was defined as swelling, marked redness, spontaneous pain, tenderness of the soft tissue at the lower third molar region, and trismus. All the X-ray films were evaluated by a single reviewer. Contact with the adjacent tooth of the completely impacted lower third molar was defined as the absence of healthy bone between the two teeth. The presence of continuous healthy bone between the two teeth was classified as non-contact with the adjacent tooth.

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Table 1. Age-specific prevalence of pain and inflammation in completely impacted lower third molars

Age (years)		23-30	31-40	41-50	51-60	61<	Total
Number of radiographs showing completely impacted lower third molars	M	181	113	68	31	17	410
	F	197	126	58	22	11	414
	Total	378	239	126	53	28	824
Number (%) with pain or inflammation	M	3 (1.7)	2 (1.8)	6 (8.8)	1 (3.2)	2 (11.8)	14 (3.4)
	F	1 (0.5)	4 (3.2)	6 (10.3)	1 (4.5)	0 (0)	12 (2.9)
	Total	4 (1.1)	6 (2.5)	12 (9.5)	2 (3.8)	2 (7.1)	26 (3.2)

Results

The overall incidence of pain or inflammation involving the completely impacted lower third molar (Table 1) was 3.2% (26 molars in 26 patients). The incidence of pain or purulent inflammation was highest (9.5%) in the patients 41-50 years of age and lowest (1.1%) in those aged 23-30 years. However, there were no significant differences in the incidence of pain or inflammation among the age groups other than 41-50 years of age. There was also no significant sex difference.

The contact of the impacted third molar with the adjacent tooth was evaluated separately in the patients with pain alone and with inflammation (Fig. 1). No patient with pain alone was older than 44 years (hatched line Figure 1; range 25-44 years; mean: 35.0 years). There was no significant age difference between the patients with pain alone with (mean age: 35.2 years) and without (mean age: 34.7 years) contact between the impacted and adjacent teeth. The patients with inflammation ranged from 29 to 67 years of age (mean age: 46.4 years), and, among them, those with and without contact between the impacted and adjacent teeth ranged from 29 to 55 years of age (mean age: 42.2 years) and from 42 to 67 years of age (mean age: 52.3 years), respectively. Nine of the patients with inflammation (4 with and 5 without tooth contact) were older than the oldest patient with pain alone.

Discussion

There are conflicting opinions that impacted teeth should be retained² if there is no substantial evidence of an acute infection or that they should be prophylactically removed because of the risk of acute inflammation.^{3,4} Leone *et al.*⁵ noted that the risk of acute pericoronitis is highest for a fully erupted, vertically positioned mandibular third molar in contact with the second molar, at or above the occlusal plane, and partially encapsulated by soft or hard tissues. Eleven (37.9%) of 29 subjects with partially erupted lower third molars (mean age: 24 years) reportedly demonstrated redness, pain upon palpation, acute pain or formation of pus.⁶ However, other than clinical observations regarding mild symptoms,⁷ such as a vague nagging sensation or feeling of pressure, and acute inflammation, the frequency of inflammation

and the factors associated with the risk of inflammation have not been identified in completely impacted lower third molars.

Patients younger than 23 years of age were excluded from this study to ensure complete root development in the study population; younger patients have pain associated with tooth eruption, and impacted third molars in young adults (mean age: 20 years) may sometimes completely erupt.⁷ Furthermore a certain proportion of third molars erupt relatively late during early adulthood, and therefore the need for surgical intervention may decrease with age.⁸

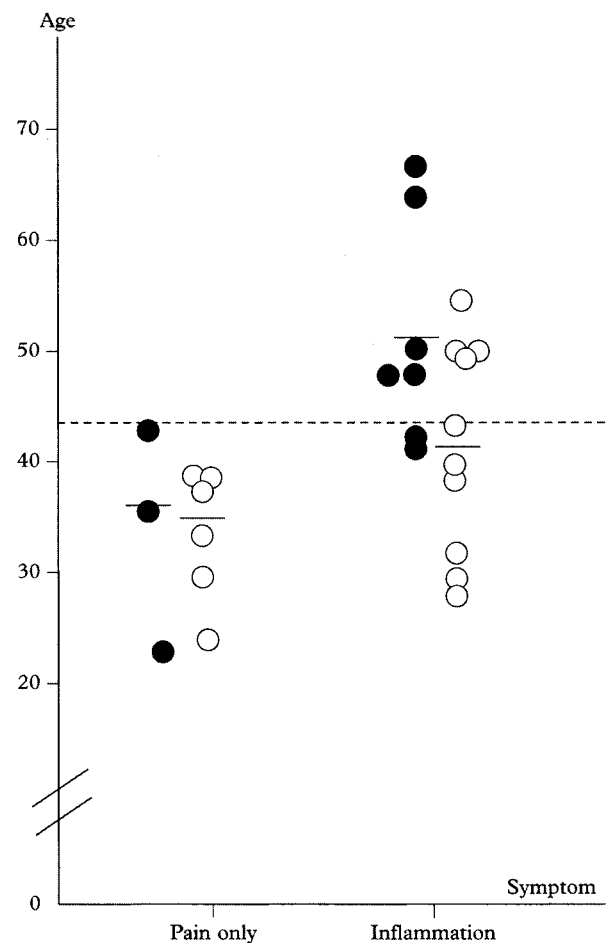


Fig. 1. - Ages of subjects with each symptom. ○, contact. ●, non-contact. ----, upper limit of age in the patients with pain only. —, mean ages.

This study revealed that the incidence of symptoms did not differ in patients of various age groups other than 41-50 years of age, but that patients with inflammation were older than those with pain only, indicating that age has a strong influence on the development of purulent inflammation associated with the completely impacted lower third molar regardless of whether or not it contacted the adjacent tooth. The general clinical impression that age does not appear to be a factor related to inflammation of partly or completely impacted third molars is not inconsistent with the authors' results for completely impacted lower third molars. The incidence of inflammation in these subjects was very low (3.2%), but does not include the frequency of inflammation in partly impacted third molars, which are susceptible to inflammation and prevalent in young adults. None of the patients with pain alone were older than 44 years of age, whereas older patients showed inflammation. In these healthy patients infection of the completely impacted teeth may have been well controlled, and the association of younger age with the symptom of pain alone may not be surprising, since pain is frequently a precursor of purulent infection. The increase in the incidence of purulent inflammation with age may indicate that the need for the removal of a completely impacted third molar should be assessed before 45 years of age. Furthermore, the presence of pain may also indicate that the completely impacted lower third molar should be removed.

These symptoms may be associated with protection against infection and bone resorption, although migration of an impacted tooth⁹ is occasionally seen. The causes of inflammation of a completely impacted lower third molar are unknown. The periodontal status may be a risk factor. Indeed, in the present study patients with inflammation of a third molar in contact with the adjacent tooth ranged from 29 to 55 years of age (mean age: 42.2 years), whereas those without contact with the adjacent tooth ranged from 42 to 67 years of age (mean age: 52.3 years), indicating that such contact may initiate infection. Control of the periodontium may influence the purulent inflammation, although bone resorption in the buccal or lingual cortical plates must be observed on occlusal films to confirm that bony or periodontal damage is present. Periodontal ligament damage may occur due to bone loss on the distal surface of the second molar adjacent to the completely impacted third molar, even if no marked periodontal disease is observed roentgenographically. Recognition of the importance of B cells in human periodontal disease¹⁰ has advanced the

immunological study of its pathogenesis. Periodontal injuries may cause direct damage to the lymphatic system, altering the local resistance to infection. If so, the differentiation between abnormal and intact periodontium would be an important aspect of dental treatment.

Even though this study suggests that ageing results in inflammation of a completely impacted lower third molar, probably due to bone resorption, it is difficult to predict bone resorption, which may occur in the absence of any systemic disease and may show different individual patterns due to many variables.

Conclusion

Early evaluation of whether the removal of a completely impacted lower third molar is warranted should be conducted in patients with the risk factors of advanced age and contact with the adjacent tooth.

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