

The anatomy of a horizontally impacted maxillary wisdom tooth

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A completely horizontally impacted upper third molar was revealed after routine dissection of a 62-year-old human cadaver of a Caucasian male. The molar was penetrating into the maxillary sinus and there was antral dehiscence of its bony alveolus. The bony alveolus was immediately in front of the greater palatine canal contents, and the bottom of the alveolus was dehiscence towards the greater palatine foramen. Within the greater palatine canal and foramen the greater palatine artery was duplicated and the nerve was found. Such antral relations of an impacted upper third molar predispose to oroantral communications if extraction is performed, while the close neurovascular relations represent a risk factor for postextractional haemorrhage and neurosensory disturbances and must be borne in mind when deciding on or performing the extraction. (Folia Morphol 2008; 67: 154–156)

Key words: maxillary sinus, greater palatine nerve, greater palatine artery, oral cavity

INTRODUCTION

Wisdom teeth are third molars that develop in the majority of adults and generally erupt between the ages of 18 and 24 years, although there is wide variation in the age of eruption. In some people the teeth become partially or completely impacted below the gum line because of lack of space, obstruction, or abnormal position. Impacted wisdom teeth may be diagnosed because of pain and swelling or incidentally by routine dental radiography [3]. In the literature the incidence of upper third molar impaction is shown to be variable, with a mean value of $44.32 \pm 9.89\%$ [2, 7].

The indications for removing impacted teeth can be divided into those of acute and those of chronic pathology. Impacted third molars are often associated with pain, infection, cyst formation, benign tumours, root resorption, bone loss, periodontal disease and caries. The criteria for removing impacted third molars surgically are often unclear [10].

While numerous papers deal with the impacted mandibular wisdom tooth and take into account its relations with the closely related lingual nerve and inferior alveolar nerve [1, 2, 4, 5, 7], there are no references available detailing the anatomical relations of the impacted maxillary wisdom tooth.

MATERIAL AND METHODS

Routine dissection was performed on the right part of the face of an adult human cadaver aged 62 years. After dissection of the superficial regions had been accomplished, cheek and lip removal allowed access onto the maxillary bone. The infraorbital nerve was visible and the anterior, posterior and the outer parts of the superior wall of the maxillary sinus (antrum of Highmore) were removed, taking care not to damage the maxillary artery that was located immediately posterior to the maxillary bone. An impacted right upper third molar became visible after the alveolar mucosa had been decollated

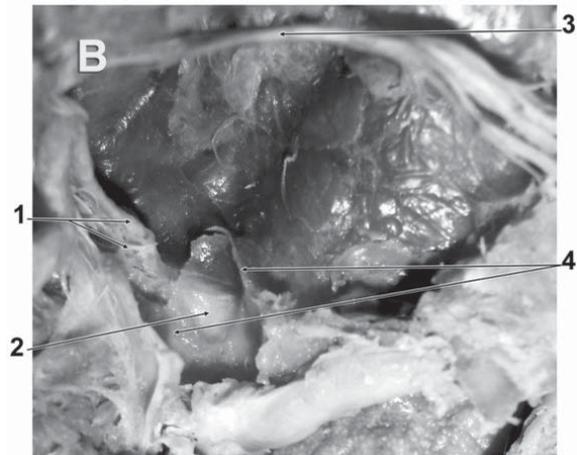
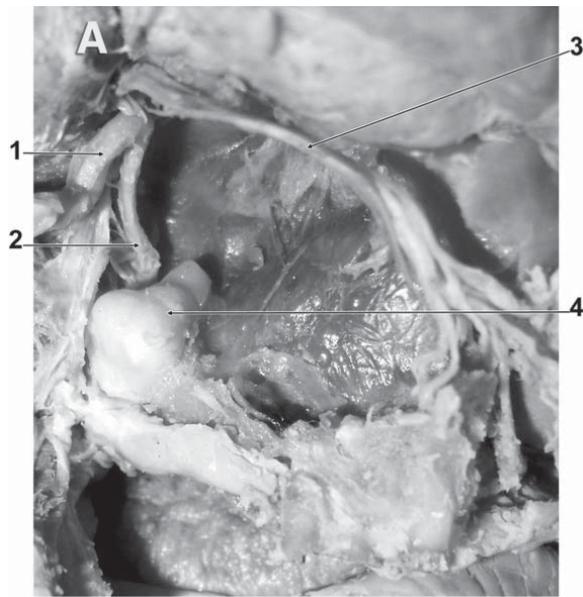


Figure 1. Dissection of an impacted right upper third molar, human adult specimen, formalin fixed; **A.** 1 — maxillary artery; 2 — greater palatine artery; 3 — infraorbital nerve; 4 — horizontally impacted upper wisdom molar; **B.** Greater palatine artery and nerve; 1 — maxillary nerve; 2 — the bottom of the impacted molar alveolus was dehiscent towards the greater palatine foramen; 3 — infraorbital nerve; 4 — the impacted molar alveolus was also dehiscent towards the maxillary sinus — antral penetration of the impacted molar; **C.** Dissection of the pterygopalatine fossa and greater palatine canal contents: 1 — maxillary nerve; 2 — pterygopalatine ganglion; 3 — duplicated greater palatine nerve; 4 — distal wall of the impacted third molar alveolus; 5 — alveolar mucosa; 6 — infraorbital nerve; 7 — maxillary artery, cut and reflected anteriorly; 8 — duplicated greater palatine artery.

from the alveolar crest. The impacted molar was removed by odontectomy to expose its bony alveolus. Individual dissection of the greater palatine canal contents was then performed, with bony removal of the alveolar crest and evidence under the palatine mucosa.

RESULTS

After the removal of the outer antral wall dissection revealed the presence at the distal end of the superior alveolar crest of a horizontally impacted right upper third molar, as shown in Figure 1A. This was completely impacted, entirely covered by soft tissue and partially covered by bone within its bony alveolus. The impacted third molar crown was directed towards the vestibule and its unique un-

developed root was directed towards the nasal fossa on that side. The impacted molar was transversally disposed immediately in front of the greater palatine canal and its contents and antral penetration were observed, together with the antral dehiscence of its bony alveolus (Fig.1A). After odontectomy of the impacted molar, the bottom of its alveolus was exposed and at this level a bony dehiscence of 2/3 mm located above the greater palatine foramen was apparent. It was noticed that while the crown of the impacted molar corresponded to the alveolar process of the maxillary bone, the root was located in the maxillary sinus and lodged in the narrower apical part of the bony alveolus (Fig. 1B). Further dissection and bone removal exposed the contents of the greater palatine

canal in direct relation to the impacted molar; the greater palatine artery and greater palatine nerve were both duplicated, the arteries each being anterior to the satellite nerve (Fig. 1C).

DISCUSSION

The horizontally impacted upper third molar would seem to be a condition that recommends caution in therapeutic approaches, regardless of the age of the patient. As Kruger et al. [6] concluded, other than horizontally impacted third molars, a substantial proportion of impaction types do erupt fully, and radiographically apparent impaction in late adolescence should not be sufficient grounds for their prophylactic removal in the absence of other clinical indications.

We distinguish two major anatomical conditions that recommend caution when deciding on or performing extraction of an impacted upper third molar:

- antral penetration and antral dehiscence of the bony alveolus that predispose to oroantral communication;
- immediate relation of the bony alveolus with the greater palatine artery and nerve, the artery (arteries in our case) being closer to the alveolus, predisposing to postextractional haemorrhage and neurosensory disturbances in the territory of the greater palatine nerve, especially when curettage of the alveolus is performed. The risk of neurovascular damage is increased by the dehiscences of the bony alveolus.

Our findings come in accordance with the observation of Rothamel et al. [9] that the greater the degree of impaction and the more advanced the age of the patient, the greater the likelihood of oroantral perforation.

On the basis of our experience, we recommend that, when absolutely necessary, the extraction of the impacted upper third molar be performed in a specialised clinic, to ensure adequate haemostasis in the event of postextractional haemorrhage with lesions of the greater palatine artery.

Nevertheless, as Mercier and Precious emphasised, the prudent course of action for the clinician

to follow is based on rational clinical decision-making using traditional methods of evaluation to achieve the optimal outcome, keeping the interests of the individual patient paramount [8]. We suggest that in such cases of impaction the decision to extract be avoided in the absence of local complications.

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