

# Traumatic Displacement of a Maxillary Primary Canine Tooth into the Middle Nasal Concha Presenting as Chronic Facial Pain: A Case Report

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The case of a 32-year-old woman who sustained a nasal bone fracture and dental trauma at the age of 9 is described in this article. Misdiagnosis of the dental displacement into the middle turbinate at the initial examination led to chronic facial pain. The cause of the pain was incorrectly diagnosed or misinterpreted by several medical specialists, including an otolaryngologist, neurologist, physiatrist, ophthalmologist, internist, radiologist, oral surgeon, dentist, and the patient's family physician. Finally, 23 years after the dental trauma, a multislice computed tomogram revealed that the primary maxillary canine was dislocated into the right middle nasal concha. The tooth, which had become embedded into necrotic, inflammatory tissue, was removed by endoscopic surgery, which resulted in full resolution of the patient's pain. *J Oral Facial Pain Headache* 2015;29:203–206. doi: 10.11607/ofph.1295

**Key words:** *chronic facial pain, middle turbinate, misdiagnosis, tooth displacement*

**D**ental trauma is relatively common and usually leads to crown or root fractures, tooth subluxation, or luxation.<sup>1</sup> Tooth injuries are particularly common during childhood and often occur as a consequence of accidents during recreational activities.<sup>2</sup> In most cases, the tooth is intruded into the alveolar ridge. Less frequently it may become completely dislocated into the floor of the nasal cavity or into the maxillary sinus. Tooth displacement into more cranial areas is extremely rare.

Unfortunately, a complete tooth intrusion is often misdiagnosed as an avulsion injury.<sup>3</sup> One reason for this misdiagnosis is the presence of clinically more relevant conditions that distract the clinician from conducting a thorough intraoral and radiologic examination of the dentoalveolar area.<sup>4</sup> This article describes the case of a 32-year-old woman who sustained a nasal bone fracture and dental trauma at the age of 9. It emphasizes the importance of taking a detailed history and performing a thorough intraoral and radiologic examination in patients with maxillofacial trauma, especially in those with posttraumatic long-term unexplained facial pain.

## **Case Report**

A 32-year-old woman presented to the Department of Maxillofacial Surgery, Split University Hospital Centre, Croatia, with severe facial pain that had started a few months after a sledging accident when she was 9 years of age. The accident involved laceration of the upper vestibule of the mouth and nasal vestibules and a nasal bone fracture as revealed by radiologic examination (Fig 1). The fracture was repositioned including nasal packing under endotracheal anesthesia. A few months later, the patient began complaining of severe pain in the middle part of her face. The facial pain led her mother to take her to various specialists, none of whom provided a correct diagnosis or effective treatment.

When the woman was 23 years of age, her pain worsened in intensity and duration. The family physician referred her to an otolaryngologist. A radiologic examination of the paranasal sinuses revealed an opacity of the right maxillary sinus suggesting sinusitis (Fig 2), which was treated with antibiotics.

In the meantime, the woman lost a considerable amount of weight (9 kg) and her body mass index (BMI) decreased to 18, so she was referred to an internist. He diagnosed anorexia nervosa and suspected that a possible cause was headaches associated with chronic maxillary sinusitis. For this reason, he sent the patient to an ophthalmologist, a neurologist, and for re-examination by the otolaryngologist. At the ophthalmologic examination the patient complained about diplopia, but the ophthalmologic findings were normal. The neurologist referred her for computed tomography (CT) scans of the brain, which were normal. He prescribed treatment for trigeminal neuralgia (carbamazepine), vertigo, and cervicocephalic syndrome. He also referred her to a physiatrist, who treated her for cervicobrachial syndrome. The otolaryngologist concluded that she had nasal septum deviation, supraorbital and infraorbital neuralgia, and chronic tonsillopharyngitis.

At the age of 24 she was again referred for radiography of the paranasal sinuses, and this revealed hypoventilation of both maxillary sinuses, most likely caused by inflammation. Because of her persistent maxillary sinusitis and headaches, the otolaryngologist advised surgery to correct the nasal septum deviation. She therefore underwent septoplasty under general anesthesia later that year.

At the age of 27 she presented for a dental examination because of pain in the right side of the face. The dentist diagnosed an abscess on the right side of the maxilla. The dentist obtained an orthopantomogram, which showed a radiolucency in the region of the maxillary right canine, lateral incisor, and central incisor. An oral surgeon considered the radiography to indicate an inflamed odontogenic maxillary cyst and he therefore performed cystectomy, apicotomy of the maxillary right central and extraction of the right lateral incisor. The dental defect was replaced by a fixed dental prosthesis.

In spite of the various procedures, the woman's pain became more frequent and more intense. Considering the findings of the various specialists, her family physician and her family doubted the truthfulness of her complaints, so they advised psychiatric treatment. Her medical condition also contributed to marital breakdown, which finally resulted in divorce.

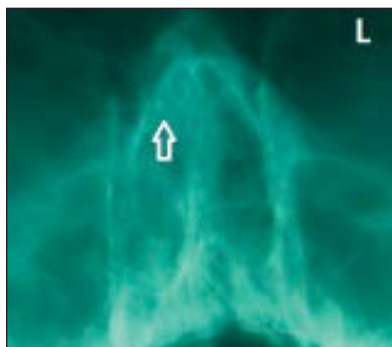
At the age of 32, 3 months before admission to the hospital, the patient experienced pain in the middle part of the her face that became continuous and gradually intensified. The patient reported that the

pain was located close to the root of her nose and between her eyes and that it radiated to her ears and both temporal regions. The spreading of the pain in terms of both intensity and quality was almost symmetric on both sides of her face but slightly more pronounced on the right side. The intensity and quality of the pain varied over the years and ranged from dull, nagging, and boring, through cramping, drilling, exhausting, to pounding, tearing, and lacerating. According to the patient's statements, in the last 3 months the pain had become "unbearable, wretched, and killing." She reported feeling that her face would burst because of the pain. The pain was triggered by coldness, cold winds, and changes in the weather and was enhanced by pressure, tension, coughing, bright lights, loud noises, sudden changes of position, lack of movement, and recumbency.

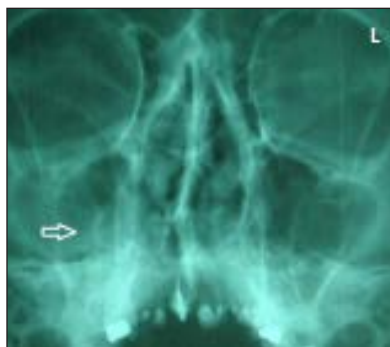
Over the years the patient had taken large quantities of numerous painkillers (salicylates, paracetamol, diclofenac, metamizole, ibuprofen, ketoprofen, and tramadol) but without success, and as a consequence she developed gastritis.

One month before her hospital admission, the patient asked a neurologist for help once again. He agreed with the original neurologic findings and therapy prescribed when she was 23 years of age. Due to the ineffectiveness of the carbamazepine, she returned to the otolaryngologist. He requested a posteroanterior skull radiograph and orthopantomogram but found them normal (Fig 3). However, he performed a rhinoscopy, which showed purulent content in the right side of the nose. He also found moderate maxillary thickening on the same side and suspected a maxillary tumor. Therefore, the opinion of a maxillofacial surgeon was requested. The maxillofacial surgeon agreed with the findings of the otolaryngologist. However, after so many different opinions, the patient was confused and requested a second opinion from another maxillofacial surgeon.

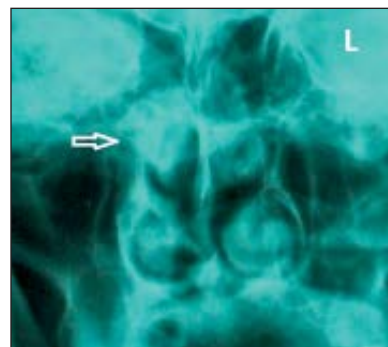
On admission to the Department of Maxillofacial Surgery, the patient showed no evident pathologic changes on external inspection. The intraoral examination was also normal. Rhinoscopically, a thickening of the lining of the middle turbinate on the right side was found, while the left side was normal. There was no tenderness to palpation. The patient was afebrile. Routine laboratory tests were normal. In the patient's records there were two radiographs of the nasal bones, three radiographs of the paranasal sinuses, one posteroanterior skull radiograph, two orthopantomograms, and one brain CT that was completely normal. Some of these images, especially the one taken 1 month before hospital admission (Fig 3), revealed asymmetry of the nasal turbinates, but there were no convincing pathologic changes to explain the patient's symptoms.



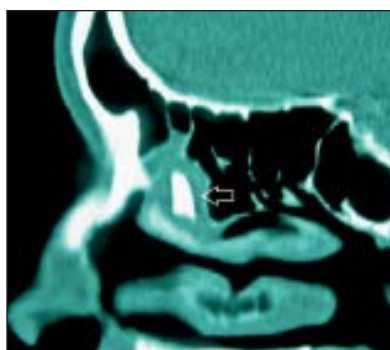
**Fig 1** Radiograph of the paranasal sinuses immediately after sledging accident. Fracture of the nasal bone on the right side is evident. (Image taken when the patient was 9 years old.)



**Fig 2** Radiograph of the paranasal sinuses 14 years after sledging accident, described as right maxillary sinusitis. An opacity that may suggest a right maxillary sinusitis is visible. (Image taken when the patient was 23 years old.)



**Fig 3** Posteroanterior skull radiograph taken 1 month before hospital admission, shows asymmetry and opacity in the region of the right middle nasal turbinate. (Image taken when the patient was 32 years old.)



**Fig 4** Preoperative sagittal multislice computed tomography. A highly opaque structure closely resembling a tooth is visible in the right middle nasal concha surrounded by encapsulated necrotic inflammatory content. (Image taken when the patient was 32 years old.)



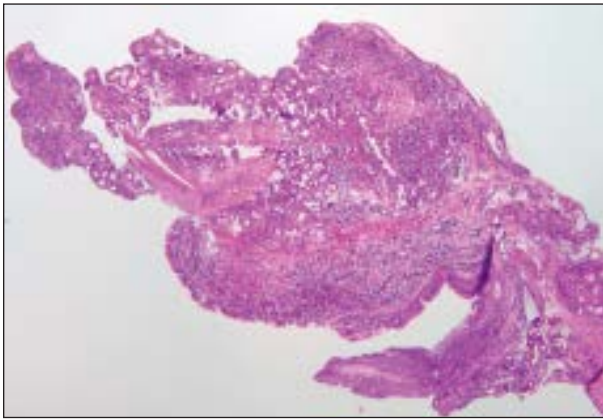
**Fig 5** Photograph of contents removed from the right middle turbinate. A tooth without a crown surrounded by necrotic content is obvious. (Image taken when the patient was 32 years old.)

The authors suspected that there might be an association between the patient's complaints and the sledging accident that she suffered when she was 9 years old. A tooth displacement was suspected based on information from her medical history describing lacerations in the vestibule of the mouth and nose at the time of the accident, although there were no data about any tooth loss. The patient's mother was interviewed for additional information about her daughter's injuries. The mother remembered that there had been bleeding from the mouth and nose but did not know the cause. It was decided that multislice computed tomography (MSCT) of the viscerocranium would be the best diagnostic technique for this difficult presentation. The MSCT of the viscerocranium clarified the situation by demonstrating a formation in the right middle nasal concha that closely

resembled a tooth. This structure was surrounded by encapsulated necrotic inflammatory tissue (Fig 4).

A tooth without a crown as well as the necrotic content was removed from the middle turbinate by a simple endoscopic surgical procedure (Fig 5). The Croatian Institute for Anthropological Research concluded, from its morphologic characteristics, that the tooth was a primary maxillary canine. Histopathology showed chronic inflammatory changes of the middle turbinate (Fig 6). Microbiological analysis of samples from the inflamed area isolated *Enterobacter* species.

Immediately after removal of the embedded tooth and the inflammatory content from the middle turbinate, the patient's pain and all related symptoms disappeared. A follow-up MSCT 2 months later was normal, and the patient had no recurring symptoms at the 5-year follow-up.



**Fig 6** Histopathologic photomicrograph of inflamed portion of the middle turbinate showing a dense inflammatory infiltrate composed of lymphocytes, plasma cells, and granulocytes. Hematoxylin and eosin stain  $\times 40$ . (Courtesy of Prof Snježana Tomić, MD, PhD, University Hospital Centre, Split.)

## Discussion

Traumatic displacement of teeth has been described several times in the medical literature.<sup>5–10</sup> This article describes a case of traumatic displacement of the primary maxillary canine that occurred during a sledging accident when the patient was 9 years of age. According to the patient's medical history, she was not examined thoroughly after the trauma at the initial examination and the attending physician did not notice the missing tooth. Also, radiographic images of the nasal bones and paranasal cavities showed only a fracture of the right nasal bone, without any other clear signs of pathology. Therefore, the tooth displacement was not diagnosed. Analysis of the entire case showed that the tooth surely had been dislocated into the inferior nasal meatus during the accident. It was also pushed upwards, toward the middle turbinate, during the correction of the nasal fracture and nasal packing. Over time, the tooth had become encapsulated and embedded in the middle turbinate. It had become a permanent focus for infection and the cause of chronic facial pain without causing any noticeable general symptoms of inflammation. Despite several additional standard radiologic examinations of the painful area, no obvious pathologic basis for the patient's symptoms was evident and so a correct diagnosis was not made. An unfortunate consequence of all these many aspects of the patient's medical history was the interval of 23 years between the dental trauma and the appropriate diagnosis and surgical treatment. It was concluded that the inflammation around the embedded displaced tooth had intensified and this had probably caused the worsening of facial pain 3 months before the patient was admitted to hospital.

Such a great delay between dental trauma and definitive diagnosis and treatment appears never to have been described in the medical literature. Furthermore, the authors did not find any published reports of such high cranial displacement of the primary maxillary canine. Also, they could not find any other cases of tooth displacement causing symptoms similar to those in this case.

In conclusion, this case emphasizes the importance of taking a detailed history and performing intraoral and radiologic examinations in patients with maxillofacial trauma. In cases of dentoalveolar trauma, counting the teeth should be mandatory. It is also recommended that in cases of long-term unexplained facial pain in patients with any history of maxillofacial trauma, the use of sophisticated radiologic techniques such as MSCT should be considered in addition to a detailed clinical examination.

## Acknowledgments

The authors would like to express their gratitude to Elizabeth Wagner, PhD (Sideview, United Kingdom), for valuable advice during the writing of the manuscript. The authors report no conflicts of interest related to this study.

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