Migrated maxillary implant removed via semilunar hiatus by transnasal endoscope

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Abstract

Endoscopic surgery via nasal approach to remove the implant body from the semilunar hiatus is presented with the images of the Computed Tomography(CT) and the intraoperative endoscopic findings.

Key words; transnasal, endoscope, semilunar hiatus, implant, maxillary sinus

Introduction

A transnasal endoscopic operation was carried out and presented the operative images to remove the maxillary implant from the semilunar hiatus. In rare cases, the body of a dental implant may migrate into the maxillary sinus. Here, we report the case of a 54 year-old woman who consulted our oral surgery clinic regarding an abnormal feeling in the right maxilla and nasal pus discharge. Anamnesis and extraoral findings suggested right maxillary sinusitis. Panoramic radiographies, including those brought in by the patient, and CT revealed the presence of a dental implant in the superior-internal region of the right maxillary sinus.

Transnasal endoscopic surgery was enable to remove the maxillary migrated implant body from the semilunar hiatus. Other possibilities regarding the utilization of the endoscope in oral surgery were also reported with a review of the literature.

Case

A 54 years old woman came to our oral surgery clinic with an abnormal feeling in the right cheek and pus discharge from the right nostril as chief complaints. These were often accompanied by headache. Panoramic radiographs brought in by the patient showed maxillary and mandibular implant dentures (implant manufacturer unknown) that had been removed three years before due to ill fitting. She complained of an intermittent, abnormal feeling in the right cheek and headache. The implant location was estimated at the superior-internal region of the right maxillary sinus, with a suspected orientation perpendicular to the sagittal plane on the image of CT (Pic. 1). She was diagnosed with right maxillary sinusitis resulting from the migration of an implant body and admitted to the university hospital for treatment. An endoscopic operation using the nasal approach was carried out under general anesthesia. The endoscopic equipment (OLYMPUS, Japan) used in this procedure was borrowed from our ear nose throat department Nagasaki Univ. The operation required fifty minutes with 60 mg of bleeding.

A rigid endoscope of 4 mm in diameter equipped with a digital video unit and optical viewing angles of 0° and 70° was used to visualize the middle nasal meatus. Careful exploration revealed the middle nasal meatus and inferior concha and recognized the semilunar hiatus (Pic. 2 A, B). One end of the implant body was seen at

the posterior portion of middle nasal meatus and removed from the maxillary sinus with a forceps (Pic. 2 C, D). As part of the treatment for sinusitis, part of tissue membrane around the semilunar hiatus was extirpated and the passage was enlarged with a backbiter. The operation was finalized after gauze packing for homeostasis (Pic. 2 E, F).

The implant body looked like a flat metallic board with a tapered section on one end and a round hole on the other end (Pic. 3 A). Quantitative X-ray microanalysis detected a peak composition of titanium (Kevex 7000 X-ray microanalyser and H-800 scanning and transmission electron microscope) (Pic. 3 B). Hematoxylin and eosin stained sample of the specimen around the semilunar hiatus showed ciliated columnar epithelium accompanied with hypertrophied inflammation underneath. Lymphocyte invasion, plasma cell and follicular lymph node were also seen (Pic3. C). Regular antibiotic and anti-inflammatory therapy was prescribed.

The patient was discharged from hospital one week after the operation and complained of any other abnormality thereafter.

Discussion

Although a not common phenomenon, maxillary dental implants may migrate into the maxillary sinus[1,2]. The posterior maxilla frequently has inadequate quality and quantity

of bone, and the contiguous maxillary sinus often provide poor recipient sites for endoosseous implants[3]. Generally, dental implants in the maxilla are of relatively higher risk of failure because of the low density and poor quality of bone for osseointergration [4].

There is evidence that contact between the maxillary sinus and implants may produce complications. Local infection of tissue around the implant is the most frequent adverse effect and may be associated with extensive resorption of the surrounding bone [2]. For this reason, implants placed very close to the maxillary sinus may offer a route for infection from the oral cavity to the sinus. Thus sinusitis can readily result from an underlying condition of peri-implantitis. Recently the device and method developed to safe installing the implant body at the posterior maxillary regieon[5].

Migration of the dental implant into the paranasal sinuses or complicated maxillary sinusitis was some times reported[6]. Specific procedures have been indicated for the treatment of migrated implants, although the indications may vary depending on the symptoms in the maxillary sinus. For instance, the sinus wall opened under local anesthesia [1,7] or Caldwell-Luc procedure[3] reported endoscopic extraction of a metallic foreign body from the maxillary sinus. The implant bodies removed via intraorally through the implant preparation site. On the other hand, if the symptoms are very mild or absent, the case may be merely followed by regular X-ray monitoring observations and antibiotic treatment for the occasional symptoms [2].

The modern endoscopic optical system made possible the examination of almost all cavities of the human body [8]. The current techniques, and adjunctive intraoperative technologies, have allowed for more precise and safer surgical dissection. Some surgical applications now include routine endoscopic management[9]. The endoscopic surgery was also introduced in the field of oral surgery for instance to remove the mucus retention cyst of the maxillary sinus [8], to diagnose orbital floor fracture [10] and to aid in the complete separation of bone and soft tissue in orthognathic surgery[11]. Removal of cysts from the maxillary sinus involved a Cald well-Luc procedure; however, with the aid of an endoscope a much smaller opening is possible. In some cases, it is difficult to diagnose orbital floor fracture because of swelling or poor radiographic imaging. An endoscope may be introduced through a smaller hole into the maxillary sinus for inspection. Further, the endoscope can be use in orthognathic surgery or in the case of transoral treatment of displaced bilateral condylar mandible fracture[12], as it enables the visualization of minute or delicate structures, such as nerves and blood vessels, within a complex surgical field.

The endoscope is particularly useful for the visualization of objects out of direct visual access through the use of optical viewing angles[12]. Endoscopic transnasal operation for the removal of dental implants from the maxillary sinus as described here offered several advantages over more conventional procedures. Advantages include reduced surgical time, and less trauma and bleeding, which often bring about a shorter

time for patient recovery. However, the endoscopic nasal approach may not be feasible if the location of the implant body is not within the reach of a surgical forceps; therefore, careful radiographic and CT evaluation is important before attempting this procedure.

Conclusion

A transnasal endoscopic operation was performed to remove the maxillary implant from semilunar hiatus.

X-ray microanalysis detected the peak of titanium from the implant body.

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Legend of figures

Picture 1. Coronal (A,B) and sagittal (C,D) images from a Computer Tomography (CT) of the patient. The migrated implant body (arrow) was located at the posterior region within the right maxillary sinus, in a perpendicular orientation against the sagittal plane. The image indicated the possibility of removal by nasal approach, as one end of the implant was situated near the seimilunar hiatus.

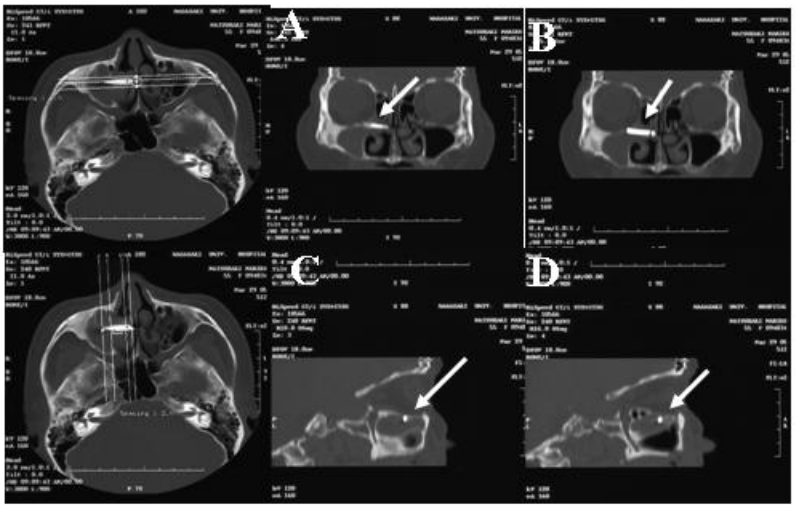
Picture 2. Endoscopic findings of the operation. A. Pus discharged from the posterior region at the middle nasal meatus. B. Mucous membrane lining the semilunar hiatus covered by pus. C. One end of the implant body was seen at the upper portion of the middle nasal meatus. D. The implant body was gasped with a forceps and removed from the maxillary sinus. E. Mucous membrane of the maxillary sinus seen through the enlarged semilunar hiatus. F. Gauze packed at the enlarged semilunar hiatus for hemostasis.

DP: discharged pus. EB: ethmoid bullae. ESH: enlarged semilunar hiatus. F: forceps. G: gauze. IB: implant body. INF: inferior nasal concha. MNC: middle nasal concha. NS: nasal septum.

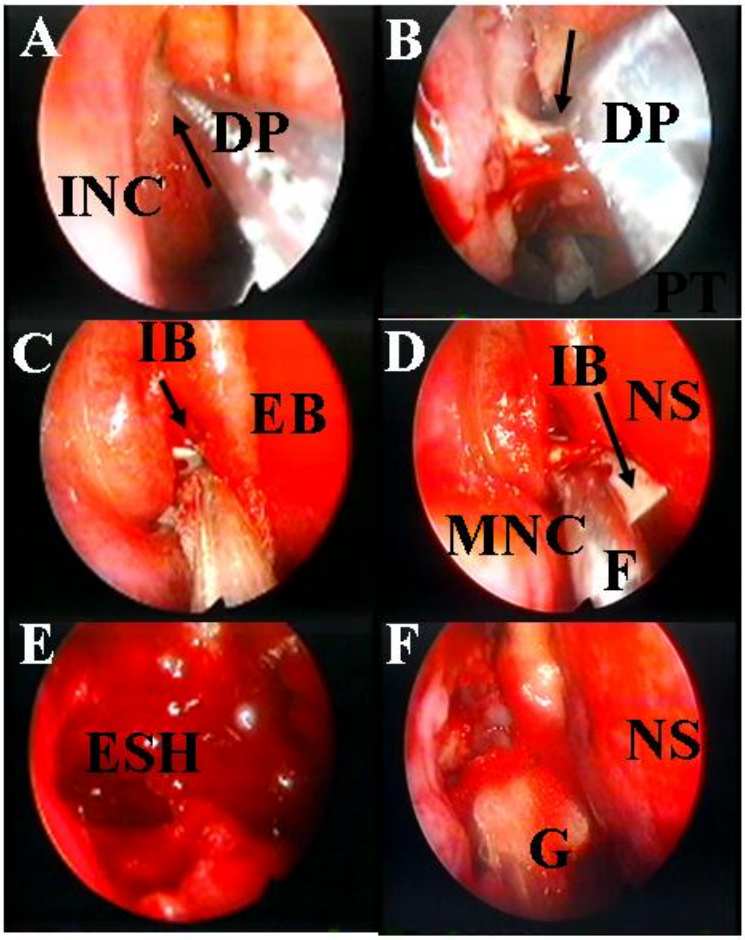
Picture 3. A. Removed implant body (↑). This implant of an unknown manufacturer was shaped like a tapered board with a hole. B. Quantitative analysis of the implant

body detected a peak in the titanium range by X-ray microanalysis (Kevex 7000 and H-800 scanning and transmission electron microscope). C. The collected soft tissue specimen stained by hematoxylin and eosin showed ciliated columnar epithelium accompanied by hypertrophied inflammation underneath. Invaded lymphocyte, plasma cell and follicular lymph node were also seen.

Picture 1



Picture 2



Picture 3