Findings that shed new light on the possible pathogenesis of a disease or an adverse effect

Dual antrostomy optical window for visualising sinus cavity during implant restoration

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Summary

The authors report a case of maxillary sinusitis that developed after placement of four dental implants. Although one implant failed due to infection, the remaining dental implants were functional. A polyp had been identified on CT scan before implantation. Discussion of the possible odontogenic aetiology of the maxillary sinusitis led to consideration of explantation. Both middle and inferior meatal antrostomy were performed for utilisation as optical windows during postoperative care, allowing direct visualisation of the sinus cavity. The characteristics of the nasal mucosa were evaluated during a series of dental treatments including implant removal, sinus floor elevation and re-implantation.

BACKGROUND

As dental implant surgery is performed more frequently, the incidence of sinusitis associated with dental implants or maxillary sinus augmentation may also increase.

CASE PRESENTATION

An otherwise healthy 60-year-old man presented with left nasal congestion and purulent discharge following placement of four dental implants onto the alveolar ridge of the left maxilla. Repeated visits to the dentist who had performed the procedure resulted in antibiotic administration. Despite several months of dental irrigation treatment, infection developed in one of the implants, which subsequently failed. Further evaluation was then performed at our hospital.

INVESTIGATIONS

Nasoscopic examination revealed an antrochoanal polyp (figure 1). Orthopantomography and CT of the sinuses showed that multiple dental implants were projecting into the left maxillary sinus cavity (figure 2). Microbiological examination was not performed.

DIFFERENTIAL DIAGNOSIS

A polyp had been detected on CT scan before implantation (figure not shown), which generated a debate on the possible origin of the pathology, whether it was coincidental or iatrogenic. Prompt explantation of the remaining implants was rejected because they were still functional. Resolving the nasal symptoms was prioritised over implant restoration due to the inordinate amount of time required to perform the necessary series of dental treatments. We determined to remove the nasal polyp via endoscopic sinus surgery. Concurrent maxillary sinus antrostomy was also planned in order to obtain an optical access route to facilitate long-term follow-up and management.

TREATMENT

Left endoscopic sinus surgery was performed. In addition to the middle meatal antrostomy, which enlarged the natural maxillary ostium, inferior meatal antrostomy was performed to allow visualisation of the maxillary sinus floor.

OUTCOME AND FOLLOW-UP

Follow-up and assessment using flexible fiberoptic nasolaryngoscopy were performed (figure 3). Mucositis resolved quickly postoperatively except in the maxillary sinus floor (video 1), where the condition persisted for 5 months (video 2) until the remaining implants were removed at our hospital. Swelling of the sinus floor resolved 1 month after explantation (video 3), suggesting that the implants had been the cause of maxillary sinusitis.

The optical window continued to be useful for sinus floor elevation and augmentation with autologous iliac bone block grafts. On follow-up examination, successful sinus floor elevation and intact sinus membrane were observed. Four months after the procedure, the sinus membrane was in excellent condition, and re-implantation was performed (video 4).

Video 1 Flexible fiberoptic nasolaryngoscopy 2 months postoperatively. The left maxillary sinus cavity was visible through MMA and IMA. IMA provided better visualisation of the floor and anterior wall of the maxillary cavity. Note mucositis of the maxillary floor. 10.1136/bcr.02.2012.5869v1

Video 2 Flexible fiberoptic nasolaryngoscopy 5 months postoperatively. Revealed persistent mucositis of the maxillary sinus floor. All remaining implants were subsequently removed. 10.1136/bcr.02.2012.5869v2

Video 3 Flexible fiberoptic nasolaryngoscopy 6 months postoperatively (1 month after explantation). Sinus floor mucositis had resolved, which suggested the dental implants as the aetiology of maxillary sinusitis. 10.1136/bcr.02.2012.5869v3

Figure 1 Left antrochoanal polyp (arrows) visible on bilateral nasoscopic images.

Figure 2 Orthopantomograph (A) and CT (B) showing multiple dental implants projecting into the left maxillary sinus cavity (arrows).

Video 4 Flexible fibreoptic nasolaryngoscopy 13 months postoperatively (4 months after sinus floor elevation). The sinus membrane was in excellent condition, and re-implantation was performed.10.1136/bcr.02.2012.5869v4

DISCUSSION

Odontogenic aetiology accounts for 10%–12% of cases of maxillary sinusitis.¹ Incidence of odontogenic sinusitis has increased in the last decade,² most commonly due to iatrogenic causes such as dental implants and extractions.³ As dental implant surgery is performed more frequently, sinusitis associated with dental implantation or maxillary sinus augmentation may increase.

The management of odontogenic sinusitis requires a multi-disciplinary approach with contributions from oral surgeons and otolaryngologists.^{4 5} Performing sinus surgery without treating the dental cause does not remedy the source of infection.

Radiographic signs of sinusitis and mucosal thickening before implant placement correlate with risk of postimplant chronic sinusitis.^{6 7} Complete resolution of sinusitis is recommended before implant surgery in the posterior maxilla.⁸ In the case reported here, consultation with an otolaryngologist before performance of the original dental procedure would have reduced the risk of odontogenic sinusitis.

Since the introduction of functional endoscopic sinus surgery, indications for endoscopic inferior meatal antrostomy have decreased considerably. Combined middle and inferior antrostomy is a controversial technique which may endanger sinusal homeostasis. However, compared with middle meatal antrostomy, inferior antrostomy facilitates direct drainage and ventilation with the aid of gravity, and also provides better exposure of the floor and anterior wall of the maxillary sinus.⁹

In the case presented here, prompt removal of the remaining implants was discussed among all parties

Figure 3 Long-term follow-up using the two optical windows. Images of the ethmoid sinus (ethmoid), posterior wall of the maxillary sinus cavity through the middle meatal antrostomy (MMA), inferior meatal antrostomy (IMA) and the maxillary sinus floor (floor) are displayed in chronological order.

concerned in the case. Although prompt explantation could have facilitated more rapid resolution of the condition,¹⁰ it was not the option we could choose because the remaining implants were still functional at that time. The explanation was postponed to allow better opportunity for counselling.

Middle and inferior antrostomy were performed to allow utilisation of two optical windows for long-term follow-up and management. Direct visualisation of the sinus cavity was possible after the procedure. At 5-month follow-up, mucositis of the maxillary floor had not resolved. The existing implants were recognised as the source of the problem, and total explantation was performed. The optical window was effective for the purposes of patient counselling, and in the process of considering treatment options, providing visual evidence of sinusitis status, outcome of explantation and subsequent re-implantation.

Learning points

- Maxillary sinusitis due to dental implants may require dental treatments such as explantation, sinus floor elevation and re-implantation.
- In cases where long-term follow-up is anticipated, dual antrostomy can facilitate drainage and ventilation, in addition to providing an optical access route.
- Direct visualisation of the sinus cavity is useful for patient counselling and determining treatment options.

Competing interests None.

Patient consent Obtained.

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