Displacement of a dental implant in the mandible body: an unusual case report

Valeria Pistilli, Vittorio Checchi, Filippo De Paolis, Roberto Pistilli, Carlo Barausse

Key words case report, failure analysis, radiology, surgical procedure, implant displacement

Purpose: To present a case of a woman referred for the management of displacement of one implant in her right posterior mandible that had occurred three days previously.

Materials and methods: After implant placement, the practitioner was no longer able to detect the implant and inserted a second one at the same site without taking a control radiograph. At the end of surgery, when a radiograph was finally taken, the first implant appeared displaced into the mandible body. The patient suffered total paresthesia on the right lower lip and chin. A flap was raised and bone osteotomies were performed on the lateral side of the mandible to create a rectangular cortical bone window that was removed. The implant was stuck by the second implant placed coronally, and only after unscrewing this second implant was it possible to remove the first one.

Results: After 18 months, the patient recovered full sensitivity.

Conclusions: In cases of implant displacement, it is always recommended that appropriate radiographs are performed to visualise where the implants could have been displaced in order to avoid more serious consequences.

Conflict-of-interest notification: The authors declare no financial relationships and therefore no conflict of interest.

Introduction

Dental implant site preparation and placement are predictable procedures. Nevertheless, some risks associated with the surgery still remain. Among all intrasurgical complications and incidents correlated to the surgical procedure, nerve damage, haemorrhage, damage of adjacent tooth, thermal damage, lack of primary stability and displacement of implants are the most common.

Displacement of implants occurs intra-operatively or within a short period of time because of mediocre surgical skills or anatomical variances of the jaws. An inexperienced operator, inadequate planning, drills overworking and incorrect manipulation have all been suggested as possible factors for implant displacement due to surgical problems.

Moreover, the deficiency of an implant’s primary stability can result from low density trabecular bone, thinness of the cortical bone, or osteopenia/osteoporosis. The bone marrow component in the posterior mandible is similar to that found in the upper maxilla, and this could facilitate possible displacements of dental implants during surgery.

This case report presents an unusual case of implant displacement during implant surgery in the posterior mandible.
Materials and methods

In July 2016, a healthy 57-year-old woman was referred by a private dental clinic for the management of displacement of one implant in her right posterior mandible. Three days earlier, during implant surgery in the right premolar area (Fig 1), an implant (3.25 mm × 8.5 mm) was accidentally displaced into the mandible body.

Immediately after its placement, the colleague was no longer able to detect the implant, and his assistant assured him that she had suctioned the implant with the surgical aspirator. Consequently, the practitioner placed a second implant (4.0 mm × 8.5 mm) at the same site without taking a control radiograph. At the end of the surgical procedure, the practitioner finally took a periapical radiograph where he identified the first implant that had been displaced into the mandible body (Fig 2).

During the immediate post-surgical period, the patient suffered total paresthesia on her right lower lip and chin area.

Cone beam computed tomography (CBCT) of the jaws showed the first implant to be in direct contact with the mandibular canal and the apex of the second implant laid into the coronal part of the first one. (Fig 3)
part of the first implant (Fig 3). Moreover, the mandibular canal appeared dislocated from the displaced implant and, due to the insufficient mineralisation of the mandibular bone, the nerve was probably shifted from its original position.

In agreement with the patient, it was decided to surgically remove the first implant.

Block anaesthesia of the right mandibular nerve was administered, together with infiltration anaesthesia of the surrounding tissues (Articain with adrenaline 1:100,000, Pierrel, Capua, Italy).

A full-thickness mucoperiosteal flap was raised in order to obtain good visibility and access. Bone osteotomies (1.0 mm x 0.5 cm) were performed on the lateral side of the mandible using a piezosurgical unit (Surgysonic, Esacrom, Imola, Italy) in order to create a rectangular cortical bone window that was then removed with bone chisels (Figs 4 and 5).

The mandible was extremely poor in the trabecular bone, so the implant was easily identified. However, it was not possible to remove it because it was stuck by the coronally placed second implant (Figs 6 and 7). Only after unscrewing the second implant for 2 mm to 3 mm in a coronal direction was it possible to remove the first implant without damaging the mandibular neurovascular bundle (Fig 8).

The second implant was then reinserted in place and the osteotomised bony window put back to its original position and fixed by an L-shape osteosynthesis plate (Tekka, Global D, Brignais, France) with three 4 mm long mini-screws (Fig 9). The mucoperiosteal flap was then sutured and a panoramic radiograph performed (Fig 10). Postoperatively, the patient was prescribed a 5-day course of amoxicillin (1 g/12 h) and a 15-day chlorhexidine 0.2% rinse. Sutures were removed 7 days after surgery.
Ten months after the removal of the displaced implant, the paresthesia had improved and the patient had recovered almost 70% of the sensitivity. The radiographic aspect showed satisfying bone integration (Fig 11), but from a clinical point of view, there was a lack of keratinised tissue (Fig 12). The plate and the mini-screws were removed (Figs 13a and b). A free gingival graft was then harvested from the palate and placed buccally to increase the amount of keratinized attached gingiva (Fig 14).

After 2 months, the clinical aspect showed healed and healthy soft tissues surrounding the healing screws (Fig 15) and the patient reported she had recovered 90% of the sensitivity in the area.

### Results

After 18 months a CT scan was performed (Figs 16a and b). Implants appeared well osseointegrated and the radiographic images showed a new formation of the cortical bone around the mandibular canal. The patient fully recovered her sensitivity and soft tissues around implants appeared healthy and well keratinized (Fig 17).
Discussion

Implant surgery is considered a predictable and safe procedure, but, especially in the posterior regions and in case of low trabecular bone density, unexpected complications may occur².

Even though they are infrequent, cases of accidental displacement of the implant in the marrow spaces of the mandibular body have been reported in the literature²⁻⁸. Implant displacement and surgeries that follow to retrieve the fixture can injure the inferior alveolar nerve (IAN)³.
Most of the 15 cases of implant displacement reported in the literature involve women, with no specific predisposition for age or for the diagnosis of osteoporosis.

In many published articles, authors propose osteoporosis as the major possible cause for implant displacement into the mandibular marrow space during its placement, even if, according to a systemic review, the association between osteoporosis and implant failure cannot be supported by any evidence.

Another possible reason for implant displacement during surgery is the lower density of the trabecular bone in the posterior mandible. In this case, even without osteoporosis, patients could experience accidental displacement during implant placement. Mandibular basal bone has lower volume and fewer trabeculae than the crestal alveolar bone and the posterior mandible has large amounts of low-density marrow spaces.

In the upper maxilla cases of migration of implants, dislocated into the maxillary sinus during the implantation procedure as a result of inadequate primary stability and/or over-preparation, have often been reported. The placement of implants with poor primary stability or with an incomplete osseointegration, can frequently lead to accidental displacement inside the maxillary sinus and in the nasal cavity.

In this case report the displacement could have been caused by a combination of over-preparation of the implant tunnel, the practitioner's negligence and the lack of trabecular bone.

To remove the displaced implant, an intraoral surgical approach was chosen. This type of surgery can mainly be divided into two categories: crestal or lateral approach. The crestal approach is quicker and can be performed simply under local anaesthetic, but produces reduced visibility and therefore the risk of further displacement. On the other hand, the lateral approach needs a much wider surgical intervention, but gives sufficient visibility and guarantees safe management of the displaced implant.

From the few articles published on this subject, it has been shown that hypoesthesia persisted after surgical removal in almost 50% of the total cases of implants displaced in the IAN area. In the presented report, the patient suffered total paresthesia of her right lower lip and the whole chin area. However, after surgery to remove the displaced implant, the sensitivity of these regions improved and after 18 months the patient recovered completely.

**Conclusions**

Dental implants can be accidentally displaced into the mandibular bone marrow space, especially in middle-aged women. It is recommended that a radiograph always be taken when a displacement occurs to try to locate the displaced implant.

**References**


