An 63-year-old patient presented with the chief complaint of an unaesthetic, mobile anterior maxillary tooth due to periodontitis. He requested a permanent fixed solution. As the patient had previously undergone periodontal therapy, we decided to maintain as many teeth as possible. Four teeth were planned for extraction (13/12/11/21) and another four were maintained (23/24/25/27).

**Treatment plan**
- right sinus augmentation
- extraction of teeth 13/12/11/21 and simultaneous implant placement in 16/14/13/21/22
- removable provisional prosthesis with delayed loading
- definitive implant-supported part-arch bridge (two years of follow-up)

**Introduction**
Thanks to advances in the field of implant dentistry, we can offer our patients ambitious treatments including fixed prosthodontic restorations with reliable long-term prognoses. However, periodontal cases involving implants are often challenging. It can be difficult to know which treatment options to consider for partially edentulous periodontal patients.

This two-year follow-up clinical case shows an interesting compromise which allowed us both to maintain several natural teeth and restore the smile with a fixed implant-supported prosthesis.

**Initial situation and diagnosis**
A 63-year-old non-smoking patient presented for consultation. His chief complaint was an unaesthetic, mobile anterior maxillary tooth (Figures 1.1, 1.2 and 1.3). He had a removable partial denture in the maxilla, and requested a fixed alternative.

Although the patient was in good health, he had previously been diagnosed with chronic periodontitis, and his former dentist had carried out non-surgical periodontal therapy. His periodontal status had been stable for six years, and he was receiving supportive therapy with a recall period of two visits per year.

The intraoral examination revealed a reduced but healthy periodontium. No probing pocket depth was present and there was no bleeding on probing. Overall, his plaque control was good. Teeth 13/12/11/21 showed an unfavourable prognosis with grade II mobility (Figure 2); tooth 27 showed no loss of attachment and no mobility. There was no posterior occlusion: teeth 14–17/22/26/34/35–37/44/46 were absent. Different options for maxillary rehabilitation were considered:

1. An implant-supported full-arch bridge from tooth 16 to tooth 26; immediate placement and loading
2. An implant-supported full-arch bridge from tooth 16 to tooth 26; delayed loading
3. An implant-supported part-arch bridge from tooth 16 to tooth 23; immediate placement and loading
4. An implant supported part-arch bridge from tooth 16 to tooth 23; delayed loading

One of the patient’s requests had been to proceed with the most conservative option. Because of this, and due to financial restrictions, he chose option 3: a part-arch bridge with delayed loading.

In the maxillary jaw, the mobile anterior teeth were planned for extraction (13/12/11/21); four others were maintained (23/24/25/27). The posterior occlusion was rehabilitated in the lower jaw by means of implants in sites 34/36 and 44.

**Treatment plan**
1. Right sinus lift
2. Extraction of teeth 13/12/11/21; simultaneous implant placement at 16/14/13/21/22; and implant placement in the lower jaw at 34/36/44
3. Removable provisional prosthesis with delayed loading in the maxilla
4. Definitive implant-supported part-arch bridge in the maxilla
5. Bridge from 34/35/36 and crown at 44 in the lower jaw
A CBCT scan allowed us to prepare for the surgery (Figure 3.1). The right posterior maxilla showed a lack of height; a right sinus lift was therefore performed with a lateral approach under local anaesthesia. The sinus was filled with Bio-Oss (Geistlich) and the bony window was covered with a Bio-Guide membrane (Geistlich). The flap was sutured with monocryl 5.0 (Ethicon).

The patient did not report any discomfort or post-operative problems. A radiographic control was performed after the surgery (Figure 3.2). Five months later, another CBCT scan allowed us to assess the quality of the sinus lift and plan the position of the maxillary implants (Figures 4.1–4.5).

After a further month, the surgical procedure was performed under local anaesthesia. Teeth 13/12/11/21 were extracted. A flap was raised from tooth 23 to 17, and five implants were placed at 16/14/13/21/22 according to the treatment plan (OsseoSpeed, Dentsply Implants). The flap was closed.
with resorbable monocril 5.0 sutures (Ethicon). A maxillary provisional removable prosthesis was provided at the same time.

Three implants were placed in the lower jaw, at sites: 34/36 and 44 (OsseoSpeed, Dentsply Implants). Oral hygiene and soft food dietary instructions were given to the patient (Figure 5). A clinical control was carried out ten days after the procedure. It showed healing around the abutments with inflammation (Figure 6).

Three months later, the mucosa around the abutments had healed uneventfully and an acceptable level of keratinised tissue was present (Figure 7.1). An impression of the implants was taken using a conventional pick-up technique. We were able to validate the impression by using copings mounted on a gypsum verification jig (Figures 7.2–7.3). This let us verify the accuracy of the impression and the passivity of the fixed prosthesis. The maxillomandibular relationship was recorded (Figure 7.4), and the tooth configuration was tried-in (Figure 7.5). A definitive part-arch bridge on an Atlantis Isus hybrid suprastructure was screwed on the implants in the maxilla (Figures 8.1–8.3).

In the mandible, a screw-retained crown on implant 44 and a cemented bridge on implants 34/36 with custom-designed Atlantis abutments were delivered. A final radiographic control was made (Figure 9).

Result

The patient was satisfied with the final aesthetic result (Figure 10). His main goal of increased function and preserving natural dentition had been achieved. At the two-year follow-up, bone and soft tissue were stable (Figure 11). Since receiving this treatment, the patient has returned twice a year for his supportive periodontal care and has continued to maintain effective plaque control (Figure 12).

Discussion

This clinical case presented a series of technical challenges which are worth discussing. In retrospect, the outcome of the sinus augmentation was far from ideal. The access point for the bony window was too far (distally) from tooth 13. The Schneiderian membrane was not raised enough on the medial wall of the sinus, which led to insufficient biomaterial filling the compartment. Additionally, the implants in the lower jaw were not placed in the planned position: the implant at 36 was not placed at bone level, and so its angulation could not allow accommodate a screw-retained prosthesis. This led to two major local risk factors for peri-implantitis: the lack of bone around the implant and the cemented bridge on the implant at 36.
On reflection, our approach for this case today would be different. Our experience and training would lead us to place a tissue-level implant with a screw-retained prosthesis. This would be especially effective in periodontally compromised patients.

The treatment options which were presented to the patient are also worthy of discussion. Each option had its advantages and disadvantages which must be taken into consideration in order to meet the patient’s expectations. Due to his periodontal status, the patient was at a higher risk of developing peri-implantitis, especially if implants were placed adjacent to natural teeth. A more aggressive approach to this case would have consisted of a full-mouth extraction, and placement of six dental implants for a full-arch implant-supported fixed prosthesis.

Nevertheless, the patient remains highly motivated and committed to effective plaque control, and comes for supportive periodontal care twice a year. For this reason, a more conservative approach for this demanding case was considered viable.
Conclusion

In daily practice, clinicians are often faced with complex decisions. This is especially the case when treating patients who have a periodontal history. There is no single protocol or procedure which can improve the long-term prognosis of the intraoral situation of a partially edentulous periodontal patient. Nevertheless, supportive therapy can be a key factor for keeping these patients in good oral health.