REVIEW ARTICLE

Stage-two Surgery for Dental Implants: Overview and Relevance of Advanced Procedures

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ABSTRACT

In daily practice, many protocols are used to provide surgical and prosthetic implant care. From the diagnosis stage to the final prosthetic placement, the practitioner must evaluate and use the appropriate means and techniques to get the best results according to the goals of the respective treatment phases. This article focuses on the second stage surgery approaches for uncovering submerged implants.

Key words: Dental implants, gingiva, esthetic, tooth extraction

According to the original protocol for osseointegrated dental implants, the second stage surgery consists of uncovering the implant that was inserted a few months earlier in a submerged mode as prescribed by the Swedish founders of osseointegrated implantology.[1] A lot has happened since this pioneering period in the mid-1980s:

1. In the early 1990s, our Swiss colleagues from the ITI team proposed a protocol for implant placement in non-submerged mode with tissue-level implants;[2] they demonstrated the effectiveness of this one-step surgical approach without reducing the chances of osseointegration of the implants[3]
2. We also very quickly braved the rule of placing implants in healthy and totally healed bony sites by defending the technique of immediate implant placement after the tooth extraction[4-6] and often combining this approach with the one-step surgical approach of our Swiss friends. We have pushed the plug even further by adopting the principle of immediate esthetic crowns when the patient's complaints and the clinical conditions are favorable and in agreement.[7-9]

These are all interesting protocols which, among other advantages, allow us to avoid the original second step surgery.

Our progress has also consisted in the technical approach of the second step surgery for situations where it has been decided to submerge the implants at the time of insertion. In particular, let's recall:

- The buccally transferred flap, a classical technique of periodontal surgery, allows to ensure a keratinized gingival band on the buccal side at the time of the surgery; the crestal gingiva is then transferred in vestibular [Figure 1]. Some variants with roll techniques[10,11] are used to thicken the buccal offset gingival flap at the same time
- The classic but very efficient free gingival graft that we can use in critical cases when we miss keratinized gingiva around the implants [Figure 2]
- The papilla technique of Palacci and Nowzari[12] which allows a better coaptation of the vestibular and lingual (or palatal) gingival flaps while promoting the formation of inter-implant pseudo-papillae [Figure 3]
- The punch-technique[13] is a facilitation approach for this surgical time insofar as it consists of a targeted and calibrated opening of the gum at the precise location of the implant emergence. We use a circular scalpel more or less calibrated to the diameter of the implant. This avoids flap surgery (more invasive) and the need for postoperative sutures. It requires at least two clinical imperatives:
  1. The presence of sufficient keratinized gingiva on the buccal side… However, we also can use a variant surgical approach as proposed by Bassi *et al*.[14] to

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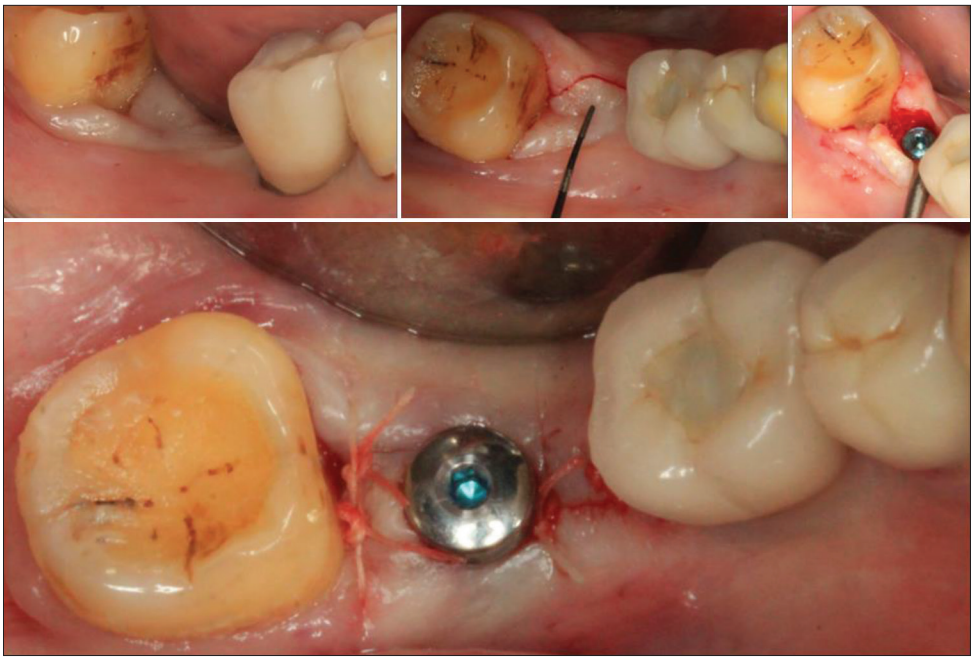

Figure 1: To get keratinized tissue on the buccal side, a protocol of flap transfer toward the buccal side is realized at the 2nd step surgery to uncover this Magix Cortex© implant that was inserted immediately after tooth extraction, 4 months ago

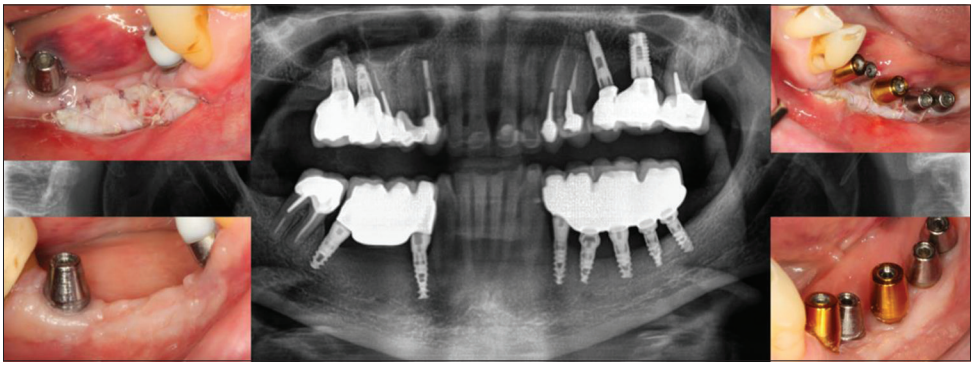

Figure 2: The free gingival graft can be realized before the implant insertion or at the time of the second surgical step, or just before the prosthetic phase… Or even afterward

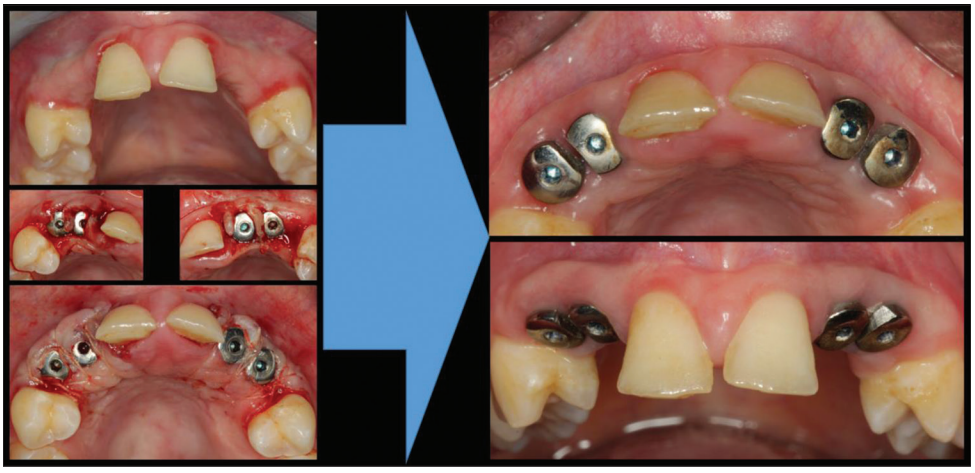

Figure 3: Here, we use the Palacci flap technique to uncover these 4 implants (Magix by Cortex©) in the esthetic zone

counterbalance the low quality of the vestibular gum

2. Preliminary identification of the exact area of emergence of the implant(s). In this respect, the initial gingival burial may have been disturbed during the healing process, resulting either in the visibility of the implant through a thin, more or less transparent gingiva at this location, or in only partial gingival coverage of the implant head [Figure 4].

In most cases, however, the implant head is invisible when the second surgical step is up to be performed. If we have used a guided implant insertion, it may be possible to reuse the initial guide to precisely find the position of the implant head; otherwise, it is better not to risk a punch-technique... Unless electronic tracking is used, as described [Figures 4 and 5]. https://www.youtube.com/watch?v=y4eG19aUQyc&app=desktop.

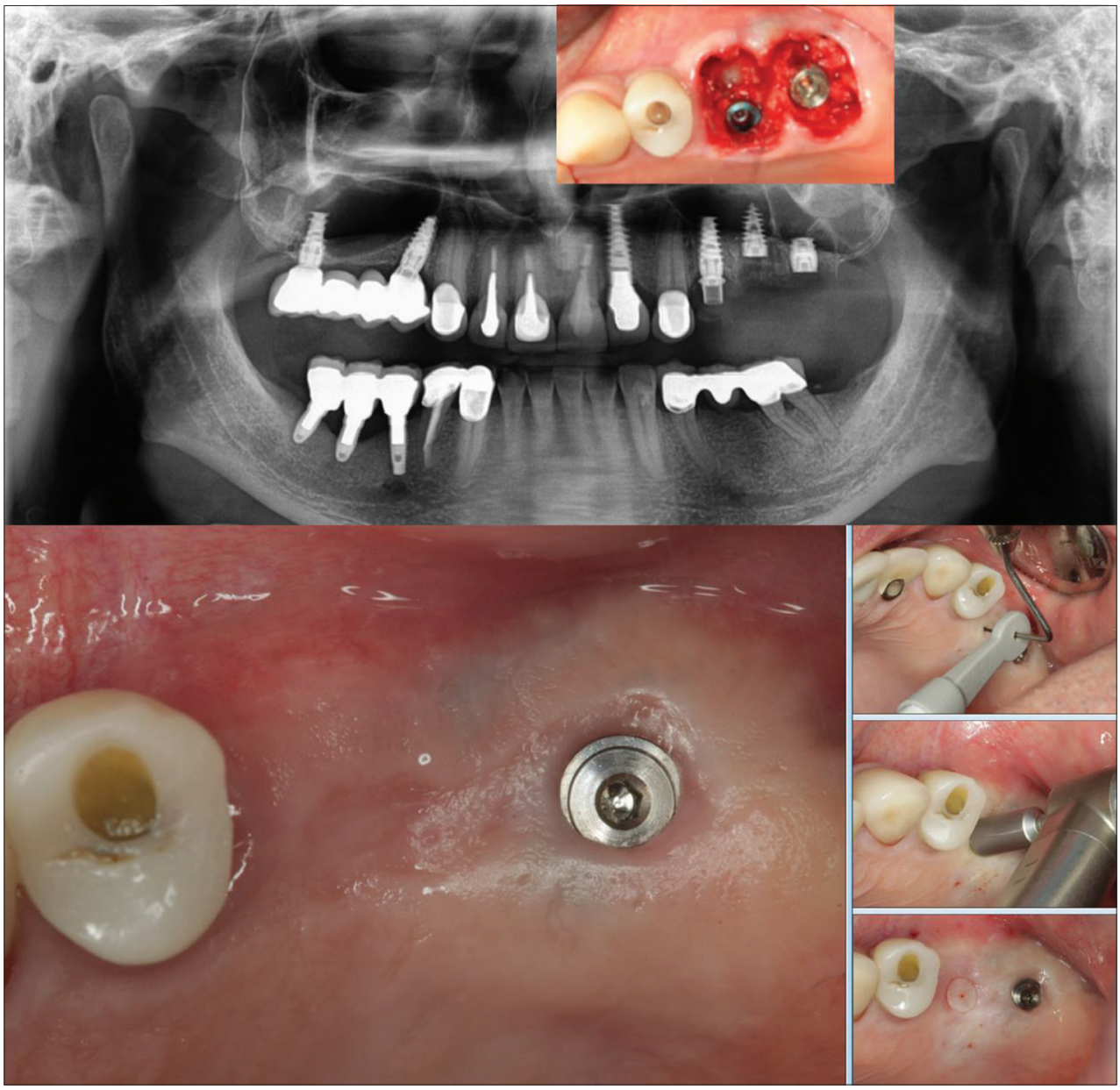

Figure 4: In this case, 2 implants (respectively Magix and Dynamix by Cortex©) were immediately inserted after teeth extraction just next the premolar implant with a temporary crown. At the time of the second surgical step, we note the complete gum recovery above de Magix implant but an almost non-recovery of the head of the distal Dynamix implant. The punch technique is well indicated here to finalize both implants uncovering

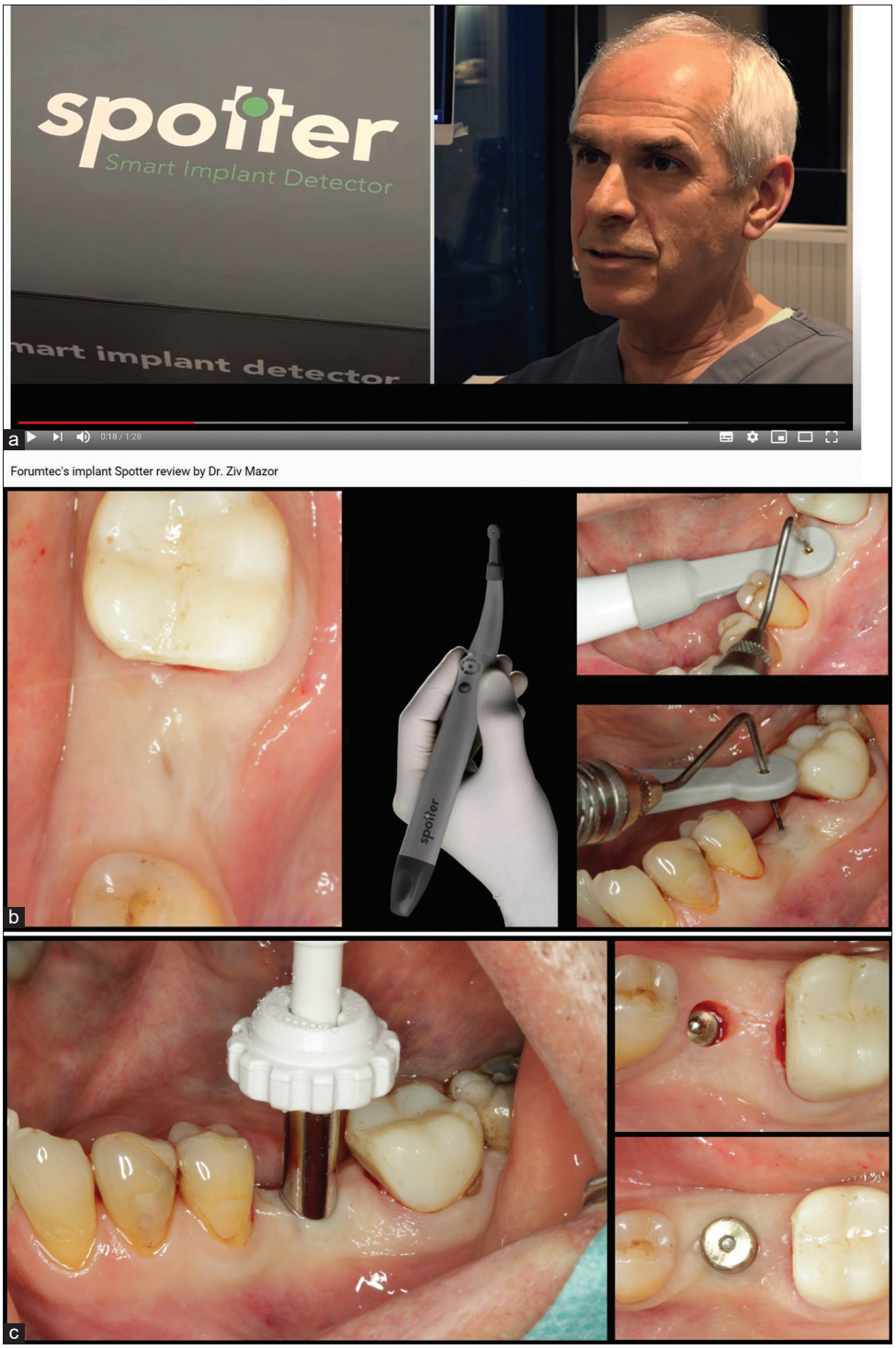

Figure 5: (a) Video demonstration for the use of an electronic device to localize the implant head that is submerged under the gum (by Dr. Ziv Masor). (b) Use of electronic tracking to localize the implant head that is submerged under the gum. (c) Optimal conditions to use a flapless punch technique at the second stage surgery for uncovering this Like A implant by Generic Implants©

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