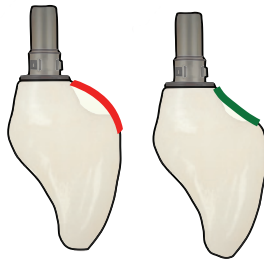


Clinical relevance of the use of implant-supported provisional restorations to contour the emergence profile



Dr Marina Siegenthaler, Switzerland

CONVEX CONCAVE



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What shape emergence profile of single implant crowns is ideal? Does the use of an implant-supported provisional restoration affect the clinical outcome and does its use justify the increase in cost and time?

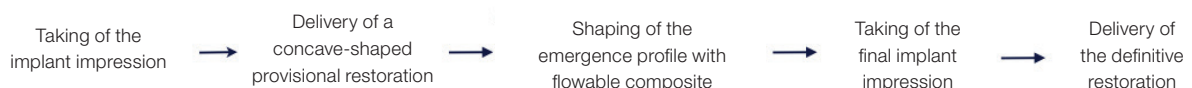
Introduction

A successful implant therapy is characterised by the maintenance of healthy and stable peri-implant tissues over time. Unless anterior implants are loaded immediately, the time between implant placement and insertion of the definitive restoration demands a provisional restoration in order to increase patient comfort and

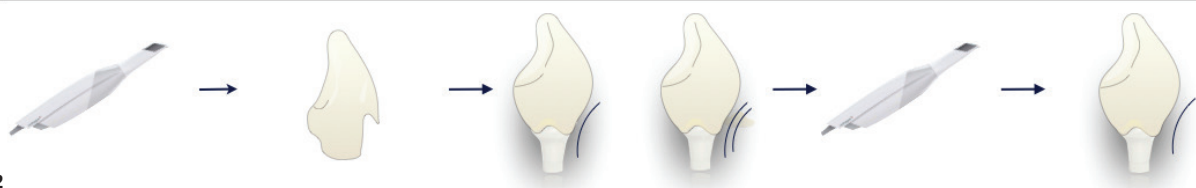
aesthetics. During this period, changes in the peri-implant tissues occur¹ which often result in a reduction of papilla height, an apical displacement of the mucosal margin and a decrease in thickness of the buccal tissue.² Subsequent remodelling processes, however, will then lead to an improvement and stabilisation of the peri-implant soft-tissue complex after one year. To minimise these changes and to shape the peri-implant tissue, the use of implant-supported provisional restorations has been suggested.³ Surprisingly and despite the widespread use of implant-supported provisional restorations in clinical practice, their potential additional value in terms of aesthetic and clinical outcomes has only recently been investigated.⁴

Implant-supported provisional restorations

Implant-supported provisional restorations are commonly used when two-piece implants are placed in the aesthetic zone, enabling individualisation of the transmucosal, peri-implant mucosa—the emergence profile—in order to better mimic the natural soft tissues and obtain a stable long-term result. These types of provisional restorations have an obvious benefit in function and aesthetics; nevertheless, they do increase the treatment cost and time. Other provisional restorations, such



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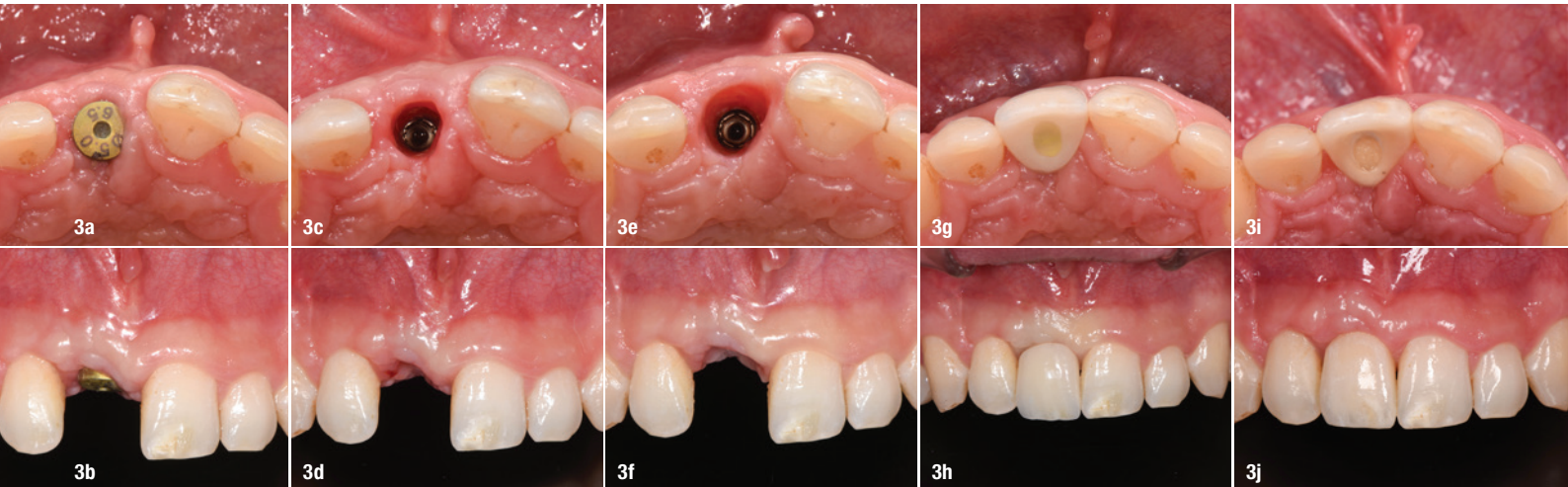
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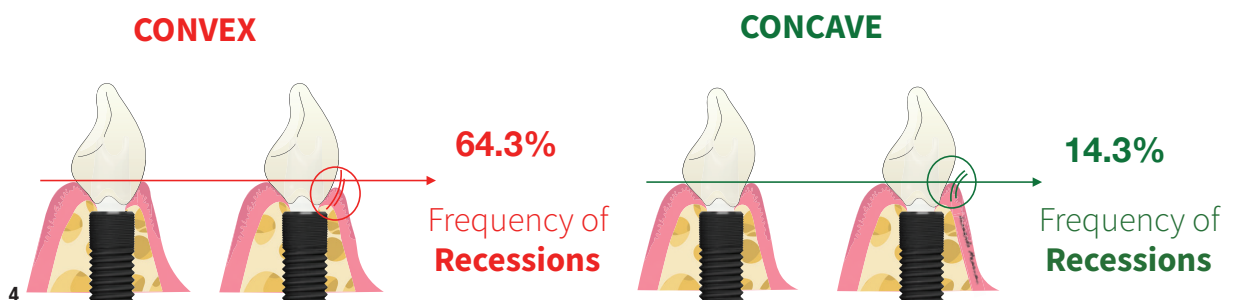


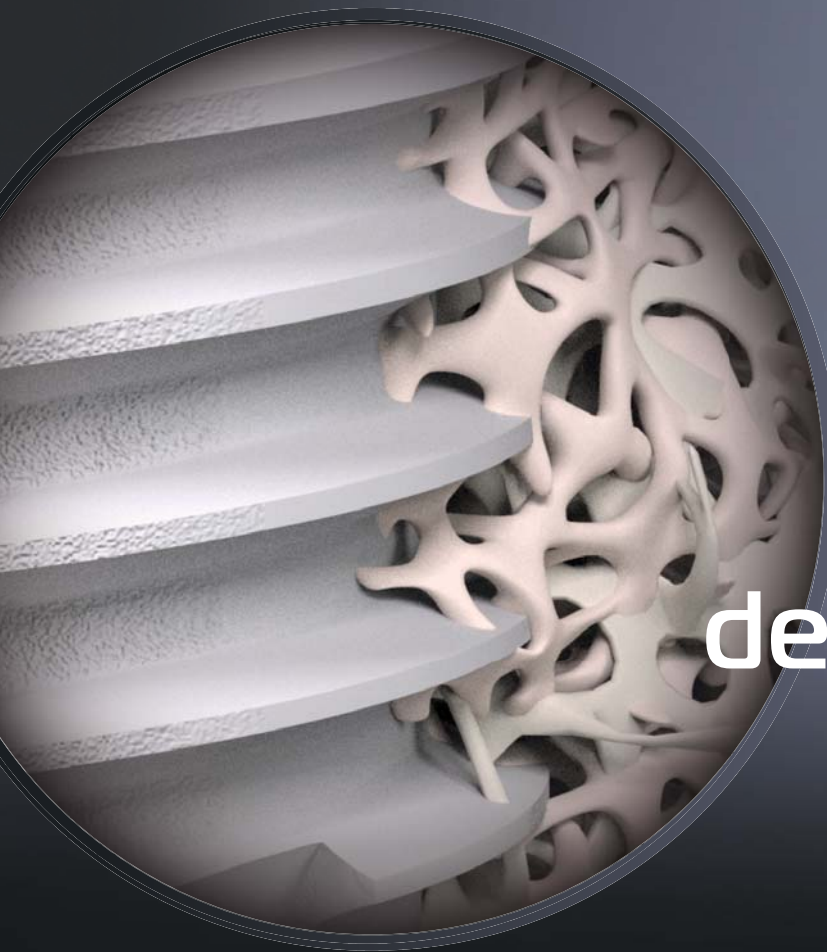
as splints, can be used as cheaper alternatives to using implant-supported provisional restorations, but these do not allow the shaping of the emergence profile. Typically, the shape of the emergence profile of implant-supported provisional restorations is either convex or concave (Fig. 1). However, and despite their wide use in daily practice, the shape that is most beneficial for the stability of the peri-implant mucosa around screw-retained restorations remained unclear. Furthermore, whether the additional investment in time and cost has a clinical impact was uncertain. A recent randomised clinical trial, however, addressed these questions and revealed that provisional restorations had a limited benefit in aesthetic and clinical outcomes.⁴

Conditioning of the emergence profile

There are different methods available to condition the emergence profile, differing in terms of the number of steps and the resulting shape. The most commonly described shape is a concave shape, allowing space for the buccal soft tissue. Conversely, a convex contour of the emergence profile has been recommended when an implant is placed in a too oral position.^{5,6} In order to avoid creating a niche for bacteria and to enable proper oral hygiene measures, a concave contour between the (too oral) implant shoulder and the crown margin is not recommended.

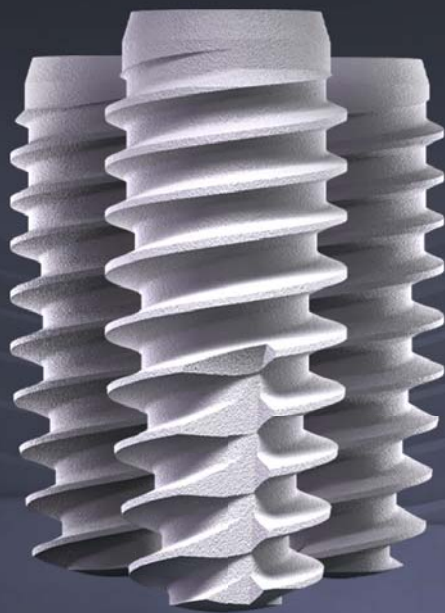
The most commonly used method in clinical practice for shaping the emergence profile is described here. After taking an implant impression, an initially under-contoured, implant-supported provisional restoration is fabricated. The buccal, cervical contour of the provisional restoration already representing the level of the prospective crown margin—usually mimicking the antagonist. This buccal initially sharp contour is filled (usually with a flowable composite) to a concave shape, resulting in slight mucosal pressure that produces local ischemia, which should subside within a few minutes. Selective pressure is added on the mesial and distal aspects to allow for papilla formation. Care should be taken not to apply too much pressure, as this can result in retraction of the tissue, causing recession and, in the worst case, tissue necrosis. The soft tissue is left to adapt, and the process is repeated after approximately one week, shaping the emergence profile further until satisfaction. Typically, two to three appointments are needed. A final implant impression (including the shaped emergence profile) is taken and the definitive restoration delivered according to the previously shaped tissues (Figs. 2–3j). Alternatively, for example in the premolar region, a healing abutment can be individualised in the same manner, avoiding the need for an implant-supported provisional restoration and decreasing costs. The before-mentioned, recent three-arm randomised controlled clinical trial compared the two different emer-





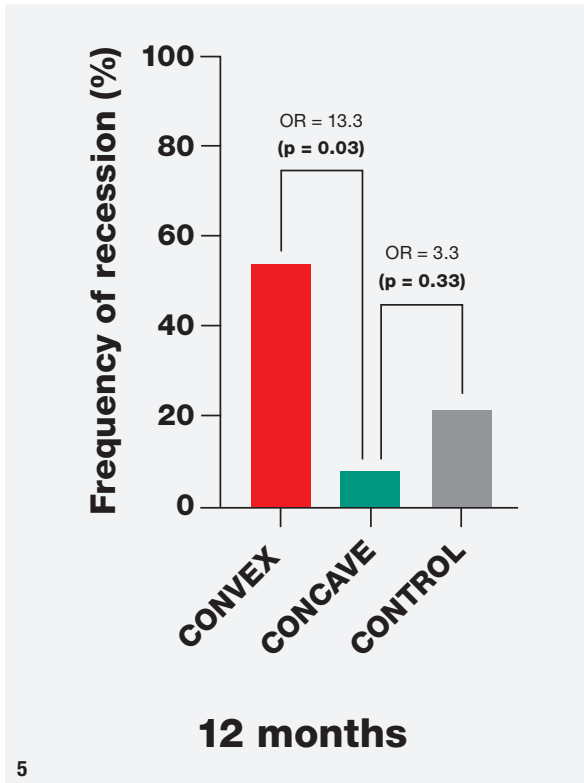
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gence profile shapes (convex and concave) to the situation when no provisional restoration was used (control). The study revealed that, at 12 months of follow-up, 64.3% of convex-shaped restorations showed mucosal recession, whereas concave-shaped restorations showed only 14.3% (Fig. 4). In the group of patients who did not receive provisional restorations, mucosal recession occurred in 31.4% at the 12-month follow-up. In addition, the odds of showing a mucosal recession at 12 months was 13.3 times higher for convex-shaped restorations (Fig. 5). Assuming that mucosal recession can have substantial effects on aesthetic outcomes, it appears

that the shape of the emergence profile should be taken into consideration when fabricating implant provisional restorations. It should be emphasised that the use of provisional restorations involved additional costs of CHF880 and the patients required 2.5 more appointments compared with those who had not received provisional restorations.

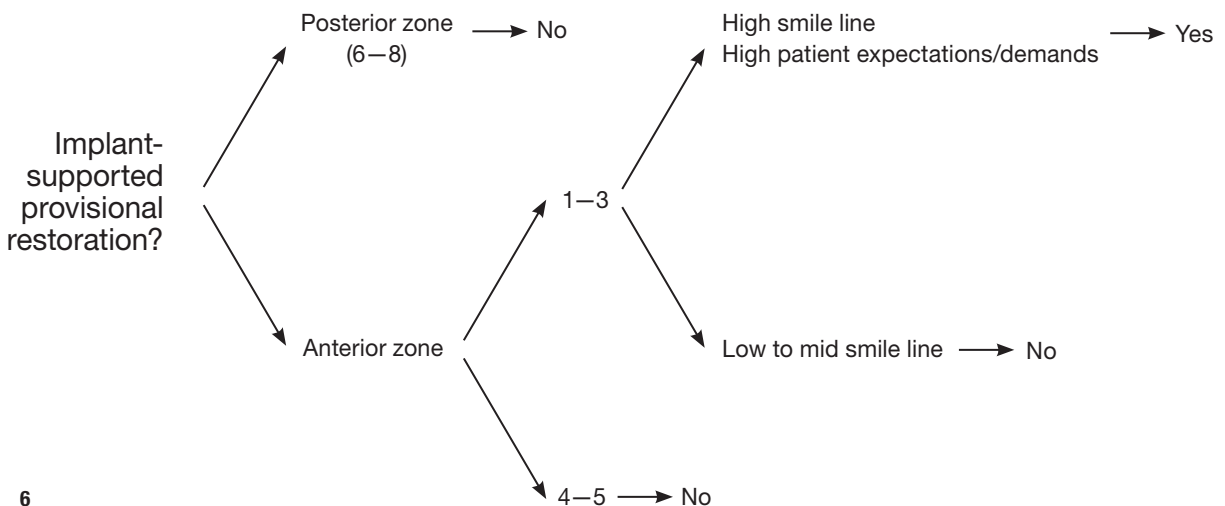
Clinical implications and summary

From a clinical point of view and given the present findings, the use of implant-supported provisional restorations might be questioned. It appears that the additional investment in time and money does not equate to a substantial improvement in aesthetic or clinical outcomes. Nevertheless, when an implant-supported provisional restoration (and crown) is used, a concave emergence profile shows a greater stability of the mucosal margin, whereas a convex emergence profile seems to be associated with a higher risk of developing recessions.

The use of implant-supported crowns, including provisional restorations, with a concave emergence profile might be recommended, as they may reduce the risk of recession. This, however, involves higher costs and treatment time compared to not using a provisional restoration and will not necessarily improve the aesthetic outcomes. The current results are based, however, on 12-month data and require further follow-up to confirm the results.

The following is recommended for clinical practice (Fig. 6):

- Provisional restorations are indicated for patients with high smile line or high aesthetic expectations.
- Provisional restorations are not indicated for premolars.
- Patient-specific considerations in this regard apply for restoration of canines and incisors.



about the author



Dr Marina Siegenthaler completed her studies in dentistry in 2016 at the University of Bern in Switzerland and received her DMD in 2018. After working in a private practice for three years, she is now at the end of the three-year specialisation training in reconstructive dentistry and oral implantology at the Clinic of Reconstructive Dentistry at the Centre of Dental Medicine

of the University of Zurich in Switzerland, after which she will be granted the title of "specialist in reconstructive dentistry" and the MAS in oral implantology from the University of Zurich. Her clinical focus is the treatment of complex and aesthetic cases using all aspects of reconstructive and implant dentistry. Her scientific interests lie in the fields of prosthodontics, implantology and regenerative procedures.

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Figure captions

Fig. 1: The shapes of different emergence profiles of implant-supported provisional restorations.

Fig. 2: The most used method in clinical practice for shaping the emergence profile.

Figs. 3a–j: The shaping of the emergence profile and subsequent impression taking and delivery of the definitive restoration.

Fig. 4: Occurrence of mucosal recessions around convex-versus concave-shaped restorations after 12 months.⁴

Fig. 5: Odds ratio of mucosal recessions for convex-shaped restorations, concave-shaped restorations and no provisional restorations (control) after 12 months.⁴ OR = odds ratio.

Fig. 6: Decision tree for the use of a provisional restoration.

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