must also be taken into account, with an average layer depth of 1.25 mm. Thus, the ratio between the length of the head (the part of the screw outside the bone) and the length of the threaded section (the part of the screw inside the bone) should be at least 1:1. Pugio et al. recommend lengths of 6 to 8 mm. Costa suggests miniscrews with a length of between 6 and 10 mm. Based on these studies, it would appear that it not necessary to use longer screws. This has been confirmed by numerous clinical studies. Easy identification of length and diameter through colour-coding of the screws can be accomplished by means of anodisation, using for example, Ortho easy (FORESTADENT). A positive side effect of this is that the oxide layer formed results in firmer anchorage of the implant in the bone.

Screw head

Some suppliers have a special head variant for each potential application in their range, such as:

- hook tops;
- ball-shaped heads;
- eyelets;
- simple slots;
- cross-shaped slots; and
- universal heads (Figs. 1.8).

The screw head should be very small and compact, to ensure that the patient experiences minimal discomfort. However, it must be large enough for the coupling elements to be securely fastened to it (Figs. 1.9).

Transgingival portion

The transgingival portion, also known as the gingival neck, is the most vulnerable part of an implant or a miniscrew. Perforation of the gingiva provides a potential access point for micro-organisms, posing the risk of peri-mucositis or peri-implantitis. This is one of the main causes of the premature loss of miniscrews. During the immediate post-operative phase, the mucosa should be as close as possible to the screw, to seal the area. The most advantageous shape transgingival collum is that of a cone, as this shape naturally results in safe sealing without a pressure zone. This makes it more difficult for micro-organisms to penetrate, thus preventing infections. The cone shape also seals the perforation wound, as a cork would seal a bottle, thus reducing bleeding.

Conclusions

The correct method of anchorage with regard to shape and quality is crucial for successful treatment. Maximum anchorage is not necessary in all cases, and thus, neither is the use of a miniscrew necessarily essential. From an historical point of view, the cortical anchorage system is, in common with other jaw orthodontic techniques, not new at all. The idea was conceived more than 75 years ago. Of all forms of skeletal anchorage, the mini-implant is the most universally used and is the most suitable for routine use. However, before practitioners can select the most appropriate miniscrew for use in their practice from the large range on offer, they will need to review the literature thoroughly.

Contact Info

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Figs. 1.9: Height difference of the screw head in two clinical situations.

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If you would like more information on the insertion of miniscrews, contact Dr Björn Ludwig at bludwig@kieferorthopädie-mosel.de.