Implant supported restoration using telescopic technology

Liviu Steier discusses implant supported over dentures using telescopic technology that can be achieved with implant supported dentures. Primary focus is on the lower jaw due to muscular insertions, minimal suction performance achievable and higher risk of mobilisation.

Schwartz- Arad (2005) researched the long term success of implant supported over dentures and concluded “Implant survival rate was 96.1 per cent (11/285 did not survive) and total 10-year cumulative survival rate was 95.6 per cent (maxilla, 85.5 per cent, mandible, 99.5 per cent).”

The edentulous lower arch presents unique challenges, especially when it is in a state of advanced atrophy. Most common, clinical situations still present sufficient remaining bone height in the interforaminal region.

This article aims to familiarise the reader with the telescopic (double crown) implant supported dentures. The telescopic or double crown technique consists of two crowns, one fixed (cemented or screw retained) and a second one mounted in the denture.

Two major double crown systems most common used are:
1. The conical crown system
2. The parallel sided crown system

The conical crown system
Retention is gained using available spring tension of outer crown covering a cemented inner crown. Ideal taper degree of 6° has been described for precious alloys (achieving a retention force of 5-10N).

The reduction of the taper degree may increase retention force while a higher convergence angle decreases it. This is of importance since multiple retainers used while allowing for adequate values to easily handle (for the patient) and not at the expense of retention loss while chewing.

The parallel-sided crown system
Retention in parallel sided crown relies on the friction gained through opposing surfaces of both inner and outer crowns and it is mandatory to achieve a clear fit between both crowns to reach the desired retention force.

When considering current available materials and technology to manufacture telescopic crown retention, Reuer et al. (2010) concluded: “Primary crown design shown to support higher retentive forces than crowns made from gold alloy.”

Radiographic examination proved a remaining mandibular height in the symphysis region of more than 12mm.

The patient was informed about the treatment options (fixed bridge on 4-6 implants vs removable over denture on two or four endosseous implants). Benefits and disadvantages were explained, postoperative compliance and oral hygiene requirements explained and discussed.

Treatment decision was taken based on patients desire to easy maintain oral hygiene. After financial evaluation and acceptance of agreed treatment a written informed consent was obtained.

Once full diagnosis was gathered and mounted study casts obtained implant position was elaborated and a surgical guide manufactured. Four Riobonza Maestro implants (external hexlock) were inserted under local anaesthesia, in the interforaminal region according to classic protocol and excellent primary stability registered. The wound was sutured and the patient requested not to wear prosthesis for eight days.

Standard postoperative treatment was composed of analogies and chlorhexidine 0.2 per cent mouth rinses, but no antibiotics. Healing concluded at no complications. The lower denture was soft lined at suture removal.

The second stage surgery (reentry) was performed three months later. A working cast was created two weeks later using an alginate impression and a custom open-tray manufactured. The two piece implant transfer system was utilised for the open tray impression.

The upper jaw cast was mounted in to the articulator using a face bow. The lower bite registration rim (created on the master cast) was used to three dimensionally correct mount the lower arch into a semi adjustable articulator. Abutments were delivered by the dental laboratory for try in and pick up impression. Prior to the
impression a second bite was registered for verification purposes. Secondary copings were performed using galvano forming. Try in with in wax mounted acrylic teeth proved the correctness of all treatment steps.

The delivery session has been documented and is presented in this paper.

The clinical pictures were taken at the delivery session.

Authors’ conclusions
A possible loss of retention has been discussed in the literature due to possible mechanical wear of the copings. With tapered construction the blockage of the parallel walls occurs just short before definitive set. This contributes to a reduced material wear.

After having restored multiple cases of lower jaw edentulism with implant supported either removable or fixed prosthetic devices over the last two decades, one of the major benefits the author has came across was the soft tissue condition during the years of compliance. Soft tissue in bar restored cases tends to become hyperplastic closing the gap to the bar and impairing regular oral hygiene.

In cases of implant retained RPD with telescopic crown retention oral hygiene was easy to be maintained and no changes from baseline, associated hard tissue values were always stable.

At the end: a satisfied, happy and self confident patient!