



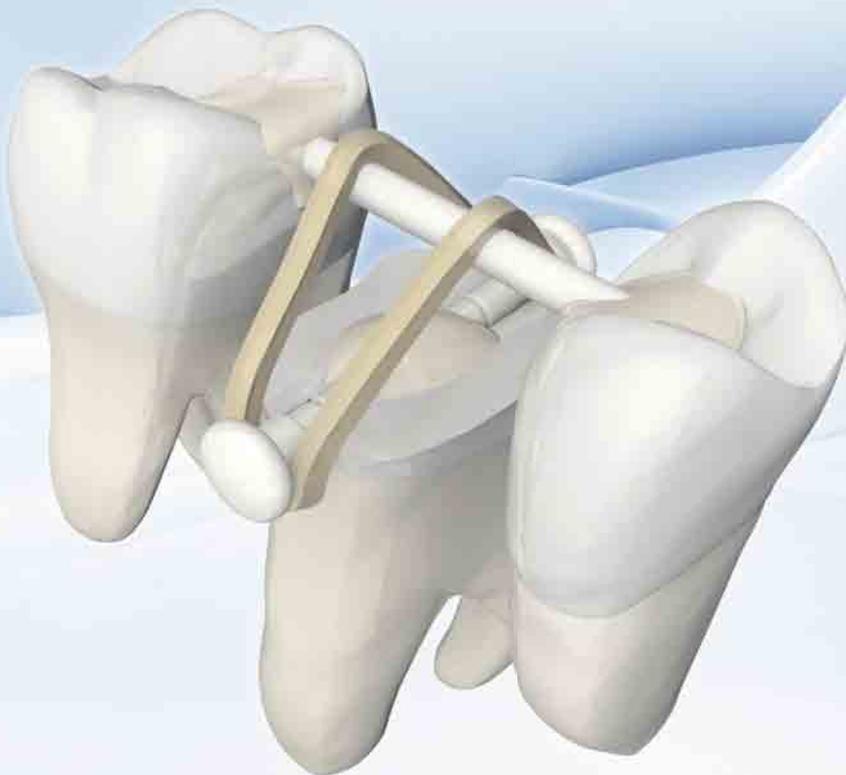
# Extrusion | TissueMaster Concept

Extraction, Replantation, Extrusion, Implantation

Regeneration and preservation of periodontal tissue structures by means of orthodontic extrusion techniques developed by Dr. Stefan Neumeyer



Quality Products  
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# TMC Extrusion

as part of the TissueMaster Concept developed by Dr. Stefan Neumeyer

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Dr. Stefan Neumeyer  
„Become a TissueMaster!“

**Regeneration and preservation of periodontal and alveolar tissue structures by means of orthodontic extrusion techniques: Creation of an almost perfect implant bed**

Dear colleague,

The extraction of a tooth launches resorption processes that lead to a considerable loss of periodontal and alveolar hard and soft tissue. The progression of these processes and the resulting tissue damage require therapeutic measures that result in the sufficient restoration of the defect.

There are numerous augmentative procedures which can be used to fill deficits in the alveolar ridge. Depending on the extent of the bone defect, these treatments can be extremely invasive, time consuming and expensive. What's more, the success of a complex augmentation largely depends on the skill and experience of the dental surgeon. The larger the bone defect, the less predictable the result.

The socket preservation method was developed in order to prevent the resorp-

tion of the buccal alveolar wall after the extraction of a tooth right from the start. Numerous investigations have shown that even with this method, the complete preservation of the bone alveolus cannot always be guaranteed. These facts have motivated and inspired me for many years, and I am now delighted to present you the results of the extrusion therapy I have developed to this end.

The therapeutic approach was developed on the basis of constant observation and consists in counteracting the resorption of the buccal bone lamella by means of biological technologies. The periodontal ligament is the key to this therapy.

The extrusion therapy constitutes an almost non-invasive therapeutic concept

that is absolutely pain free to the patient. The complete preservation of the alveolus and the regeneration of all alveolar structures are achieved in considerably less time than with any other comparable method. The feasible and predictable clinical results are more than on a par with those achieved by surgical techniques. The extrusion therapy developed by Dr. Neumeyer can easily be used by any dentist and does not require special surgical skills.

I wish you great success in the creation of optimal implant sites with the new TissueMaster Concept!

Best regards  
Dr. Stefan Neumeyer



**Extraction, Replantation, Extrusion, Implantation**

The philosophy behind the replantation and extrusion of root segments is the preservation and regeneration of alveolar tissue structures.

- The preservation of alveolar structures is achieved by replantation
- The objective of the extrusion is a coronal movement of alveolar structures
- The treatment concept is logical, simple and efficient
- The instruments are elegant and well thought-out

During the replantation and extrusion of root segments, the dentist makes use of the biological potential of the supra-alveolar fiber system and the periodontal ligament. The treatment steps are minimally invasive, time-saving and gentle on the patient, eliminating the need for surgical interventions in most cases.

If the periodontal ligament surrounding the tooth to be extracted is still intact, a segment of the root can be replanted. After gently extracting the tooth, a segment of the root is resected and replanted in the alveolus. Provided that the segment is absolutely immobilized, the periodontal fibers will reattach within a few days. In case of a segment of a non-congruent shape, the waiting time should be increased to up to 30 days.

The firmly incorporated segments can then be prepared for the subsequent extrusion with the instrument sets 4628 and 4629. The replantation of the root segment prevents the resorption of the buccal bone lamella, and the subsequent extrusion facilitates the vertical gain of hard and soft tissue. The newly gained additional tissue is not only particularly useful in those regions where aesthetics are an important aspect, but also improves the long-term prospect of all implant-supported reconstructions. After the successful extrusion of the segment, the bone should mature for 4 – 6 weeks in the case of the lower jaw and 8 – 10 weeks in the case of the upper jaw before the implant is inserted. The implant can then be inserted into the

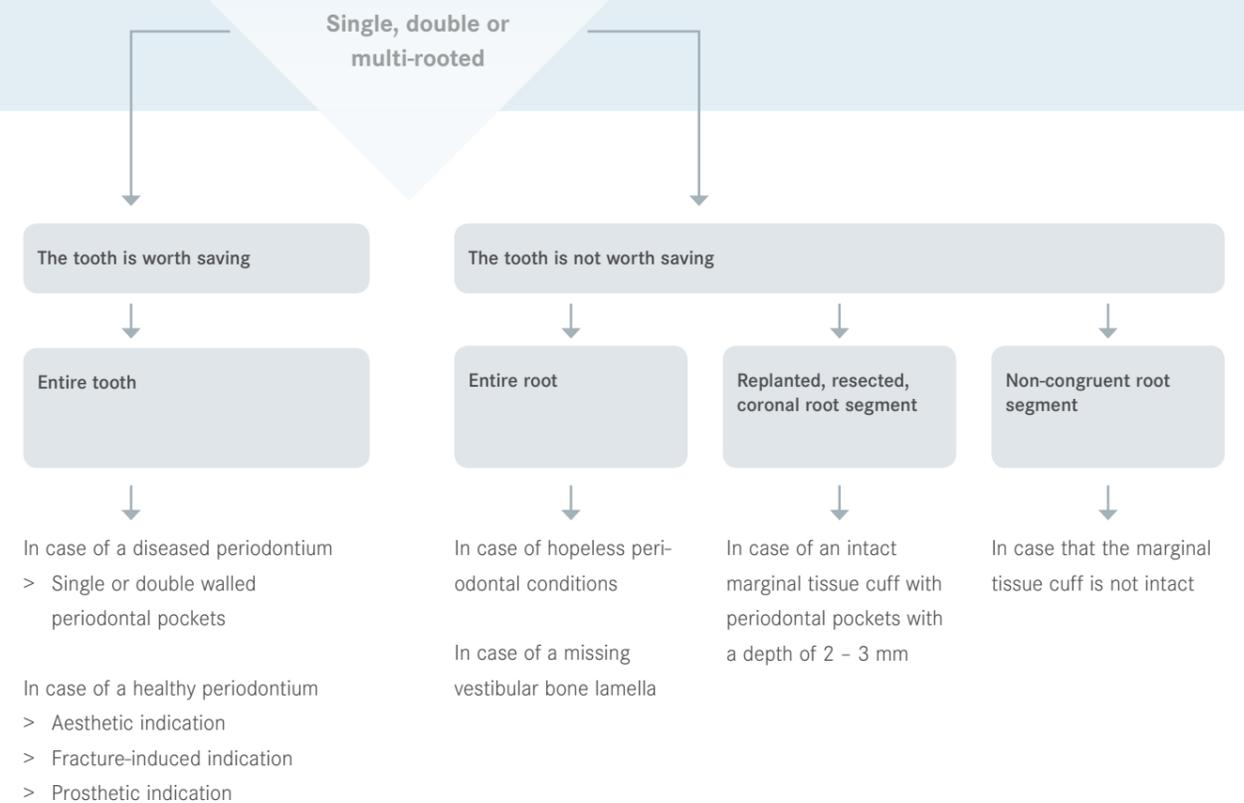
completely preserved alveolar process without further augmentative measures. A stable circular bone wall of at least 1 mm around the implant is the best protection from periimplantitis at a later point.

The extrusion therapy is a valuable complementary concept to enable the creation of an optimal implant site.

Even the extrusion of the root of a tooth with a periodontal defect can help to create a perfect implant site. The extrusion is always carried out with the maximum possible force. A waiting time of up to 4 – 6 months has to be observed prior to the implantation in case of an extrusion of an entire root. This is due to the orthodontic forces and the action time of the extrusion. In this case, the extrusion therapy facilitates the creation of a notably improved bone site for the subsequent implantation as well.

Based on biological laws, the extrusion therapy facilitates the achievement of a predictable treatment result that remains stable over a long period of time.

# Decision Guidance Extrusion of Teeth



## Basic follow-up for extrusions

**Entire root**  
 Regenerative maturation process  
 Orthodontic treatment time  
 A long waiting time of 4 – 6 months is required

**Root segment**  
 Regenerative maturation process, depending on the congruence of the shape of the replant and the alveolar wall

- ➊ Extrusion/resection/replantation in case of a shape mismatch
  - > Fixation during 10 days
  - > Fixation during 30 days
- ➋ Extrusion by 1.5 – 2 mm possible within 2 – 8 days
  - > Fixation during 4 – 6 weeks (lower jaw)
  - > Fixation during 8 – 10 weeks (upper jaw)
- ➌ Extraction of the remaining segment and implantation of a one-piece Aesthura® Immediate



#### Basic extrusion procedure

First of all, the clinical crown has to be shortened to gingival level to gain sufficient space for the extrusion. A groove is drilled in buccal/lingual direction to receive the extrusion pin.

After that, the pin is fixed to the tooth with composite according to the adhesive technique. The lenticular element is then positioned as required and attached to the extrusion pin with composite. The pin system already has the ideal micro structure for bonding with the composite.

The extrusion bar is attached to the adjacent teeth, thus serving as a counter bearing to the dental elastic. Like that, the tooth to be extracted is subjected to continuous tension. Depending on the anatomy of the root, the tooth moves within 3 – 10 days. The patient should change the dental elastic twice a day.

**The traction principle of the extrusion therapy applies equally to all types of teeth.**

**Contrary to orthodontics, the extrusion therapy is carried out with the highest possible, forced tensile force.**

#### Removal of a tooth by extrusion

A tooth that has to be removed can be “pre-extruded”. After approx. 1 – 2 days, the tooth will have reached a mobility of grade 1 – 2, which makes the tooth considerably easier to remove. Even entire molars can be removed according to this method in most cases. The extrusion therapy is also an option when a tooth has to be removed due to fracture.

#### Extraction, resection, replantation and extrusion

If a tooth can be extracted without damage to its periodontal ligament fibers and the osseous alveolus, the tooth segment can be resected and replanted. For a successful replantation, an intact periodontal ligament of 2 mm on the surface of the segment is required on one hand, and a largely intact osseous alveolus on the other hand.

After the extraction of the tooth, the root is recessed with a tungsten carbide cutter (H254E), leaving an intact circular periodontal ligament of 2 mm. During the extra-oral treatment, the root segment is held with special tweezers and lubricated with sodium chloride in order to preserve the important periodontal ligament as much as possible. To protect the pulp cavity from bacteria, it is sealed with composite. The prepared root segment of a congruent shape is replanted and will integrate within a few days. Even fragments with a non-congruent shape can be successfully replanted at a distance of up to 2 mm from the alveolar wall, however, in this case, the immobilization period during the healing phase should be increased to up to 30 days. Absolute immobilization dur-

ing the healing phase of the root segment must be guaranteed!

After the successful replantation, the root segment is prepared for the extrusion which should take place within a few days. After this, the replant is fixed to the temporary appliance in order to bridge the maturation phase of the bone. This takes 8 – 10 weeks in the upper jaw and 4 – 6 weeks in the lower jaw. The root segment is removed prior to the insertion of the implant.

The implant can then be inserted into the sufficiently regenerated local bone.

Thanks to the extrusion therapy, the body’s own bone is sufficiently renewed in very little time. The original bone and tissue structures are completely preserved or even improved through the extrusion of the root fragment. The implant can be inserted in a more successful and predictable manner and the extrusion therapy considerably improves the long-term prospect of implant-supported prosthetic reconstructions.



All photographs by courtesy of Dr. Stefan Neumeyer.

[ 1 ] Deep periodontal defect, tooth 46 with bifurcation.

[ 2 ] Extracted tooth.

[ 3 ] Extracted tooth, resected, with circular ligament on both root stumps.

[ 4 ] Reimplanted segment.

[ 5 ] Extrusion of the root segments after positioning of the extrusion bars.

[ 6 ] Radiograph to control the coronal movement.

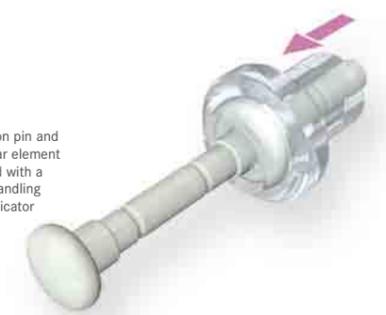
[ 7 ] Radiograph to control the body's own augmentation.

[ 8 ] Clinical image of the obtained quadrangular bone profile.

[ 9 ] Insertion of an Aesthura® Classic Implant immediately after the extraction of the root segment.

[ 10 ] Clinical result: An integrated, implant supported prosthetic restoration with quadrangular emergence profile.

**Instruments for the extrusion therapy**



**Work on teeth:**



**Creation of segments:**

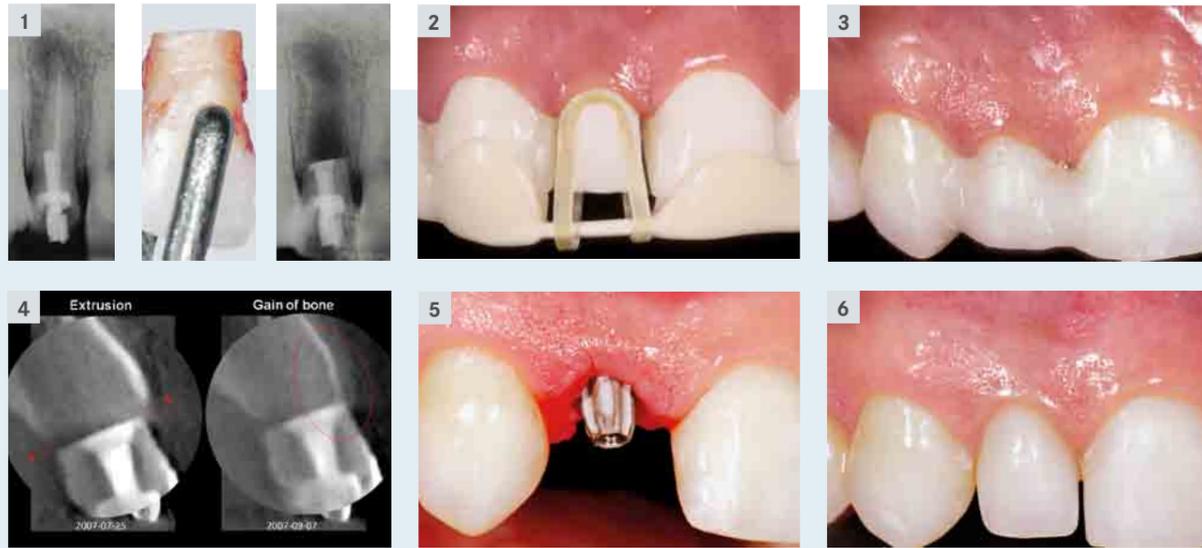


**Set TMC Extrusion**

4628/1 Set TMC Extrusion Pin

**Instrument set TMC Extrusion**

4629



All photographs by courtesy of Dr. Stefan Neumeyer.

[ 1 ] Recessed tooth with an intact, 2 mm wide periodontal ligament on the root surface, prepared for replantation.

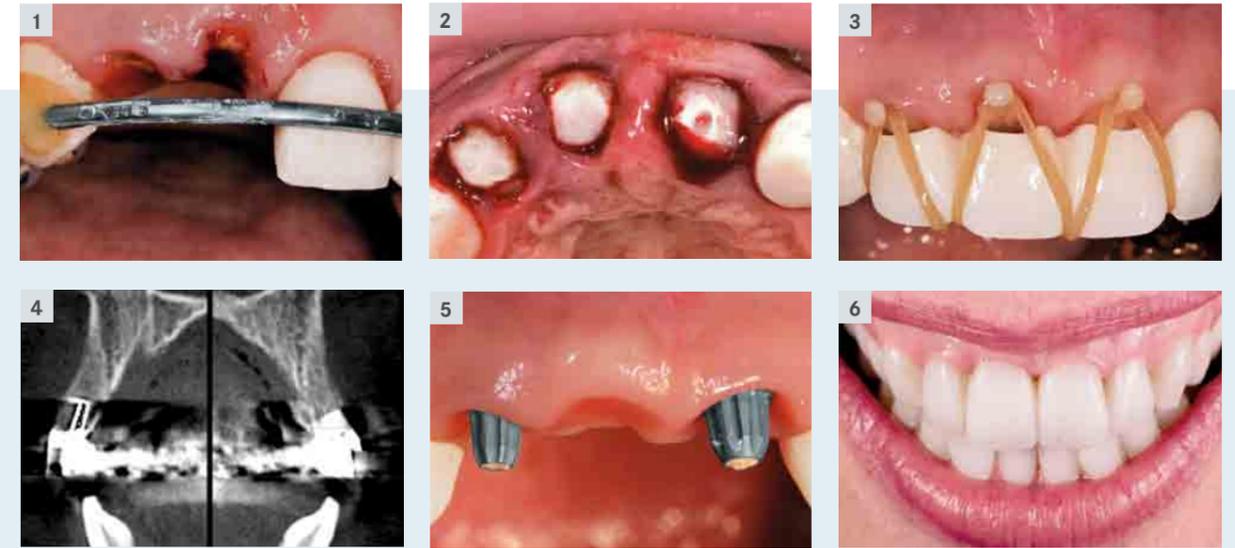
[ 2 ] The healing of the tooth fragment is followed by an extrusion of 2 mm.

[ 3 ] Resting phase after the extrusion, perfect preservation of the hard and soft tissue.

[ 4 ] Preservation and regeneration of the buccal bone lamella thanks to the extrusion therapy.

[ 5 ] Minimally invasive insertion of an Aesthura Immediate implant. Sufficient bone and soft tissue is available.

[ 6 ] Healthy, speckled gingiva with an aesthetically pleasing, harmonious contour.



All photographs by courtesy of Dr. Sabine Hopmann.

[ 1 ] Trauma to incisors. The patient was first introduced a fortnight after receiving primary care at the dental clinic of the local district hospital. Injury to the hard dental substance and soft tissue (the gingival margin at tooth 11 was reduced by 2 - 3 mm).

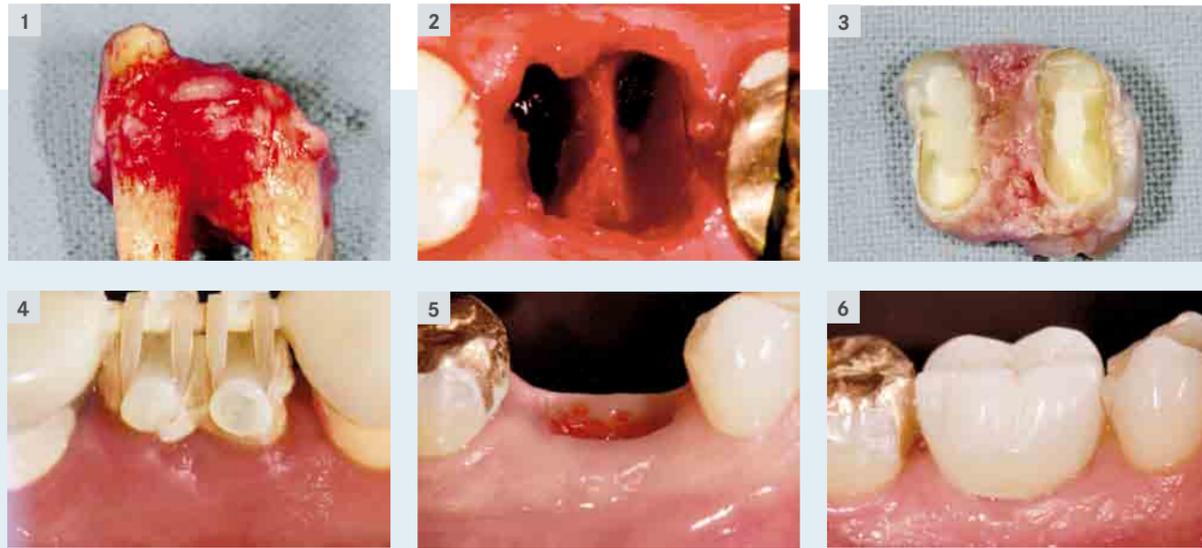
[ 2 ] Gentle extraction of the roots after forced extrusion and replantation of root segments 12, 11 of congruent shape and a non-shape congruent root segment from the central third of the root of tooth 11 in the alveolus of tooth 21. Waiting time: 30 days.

[ 3 ] After the healing of the segments, 2 mm extrusion underneath a firmly fitted temporary appliance. After that, the root segments were attached to the temporary appliance with composite until the completion of the bone maturation phase.

[ 4 ] Fully regenerated osseous alveolus below the root segment. The vestibular bone wall was completely preserved.

[ 5 ] Two one-piece Aesthura Immediate implants in place. The contour of the marginal gingiva was completely restored.

[ 6 ] Implant-supported prosthesis in the mouth. Note the patient's high smile line.



All photographs by courtesy of Dr. Stefan Neumeyer.

[ 1 ] After the extrusion: Gentle extraction of an entire multi-rooted tooth.

[ 2 ] Completely preserved osseous structures after the extrusion.

[ 3 ] Extracted tooth roots with intact circular periodontal ligament. The pulp cavities are sealed with composite and prepared for the replantation.

[ 4 ] After a healing time of 10 days, the root is extruded by 2 mm.

[ 5 ] After the removal of the tooth fragment, sufficient bone and soft tissue is available to insert the implant in a minimally invasive manner and with predictable long term stability.

[ 6 ] The definite implant crown with a healthy, harmonious contour of the soft tissue.



All photographs by courtesy of Dr. Stefan Neumeyer.

[ 1 ] Tooth 22 – not worth saving.

[ 2 ] Resected root segment with intact circular periodontal ligament. The pulp cavity is sealed to protect it from bacteria.

[ 3 ] Replanted tooth segment in place. The site remains immobilized for 10 days.

[ 4 ] Glued temporary appliance. The tooth segment is prepared for the extrusion.

[ 5 ] Successful extrusion by 2 mm after 3 – 5 days. This is followed by the fixation of the tooth segment to the temporary appliance in the upper jaw for 8 – 10 weeks to allow for the maturation of the bone.

The subsequent implantation takes place in the completely healed hard and soft tissue. The resorption of the osseous alveolus was completely prevented.

[ 6 ] Osseo integrated implant with prosthetic reconstruction and perfectly preserved hard and soft tissue thanks to the non-invasive extrusion therapy.

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