

Alternative Technique of Dental Extrusion for Prosthetic Purpose

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Abstract

It is described a technique to recover mono bi radicular teeth alternative to the more known “crown lengthening”, “rapid orthodontic extrusion with fibrotomy”, “post extractive implant”. This technique, called “PET” shows same advantages that are reviewed.

The need of our research was to look for a procedure that could be performed immediately, without preparing for a big surgery, in case of an unexpected fracture of part of a tooth. Some Korean authors described an “open flap” surgical extrusion in 2004. The change that has been made with PET is that it is a flapless technique, so it can be performed, when necessary, immediately, without postpone to another appointment, since the necessary tools are that for a normal extraction, in addition to a suture. Our hypothesis was: “If a dental reimplant works well, even when the tooth has been out of his socket for some time, the surgical extrusion (PET) will work well a fortiori”.

Keywords: *Crown lengthening; Intentional reimplantation; Rapid orthodontic extrusion; post extractive implant*

Introduction

Dentists use often, in their daily practice, techniques and procedures that give them great satisfaction for their high success rates, even if they are not validated by the scientific literature enough. This happen perhaps because they don't give any commercial benefits not availing of any particular material or equipment. One of these techniques is the “PET” (Partial Exodontic Technique), so called by its developer, the doc. Paolo Guazzi from Modena (Italy). The PET simply consists in a surgical extrusion of a compromised tooth so to make it accessible to the reconstructive procedures after a rest period of 60 days. It is neither a very delicate luxation, performed with thin extraction levers without neither traumatize nor the root neither the surrounding alveolar bone, followed by the extrusion and the fixation of the root in the new position. After an adequate waiting time, normally 60 days, the tooth regains his stability and can be treated with the normal reconstructive procedures.

Indications

Monoradicular teeth (or biradicular ones with non divergent roots) with crown destruction up to the iuxta or sub gingival level, due to carie or fracture. PET is more indicated in the upper arch where the bone is less dense compared to the lower one, with less risk of fracture of the root during the extraction, but can be used even on the mandibular teeth in selected cases. As well known, to be able to rebuild a tooth with iuxta or sub gingival loss of substance, it is needed to restore an adequate “biological width”, that is the vertical space between the bone ridge and the level of the healthy dental substance necessary for the epithelium - connective tissues attachment. It has been demonstrated that this space changes in relation to the subjects (thin or thick biotype) and to the position, however it measures an average value of 2.73 mm sulcus included (Gargiulo). Moreover it is needed a further vertical space to obtain the “ferule effect”, the 360 degrees space surrounding the root necessary to the closure and the correct retention of the prosthetic crown. This must be at least 2 mm

high (Galen, Mueller). So it can be deduced that, since having a tooth to be extruded of 4 - 5 mm the length of the root must be such to allow this without to cause loss of stability. These rules are valid for the PET but also for the more known techniques of "Crown lengthening" (CL) and "Rapid orthodontic extrusion" (ROE), techniques to whom the PET is proposed as alternative, as well as the extraction followed by the replacement of the tooth with an implant. The advantages against the CL are:

- a. Not creating difference in level of the gingival margins in esthetic areas;
- b. Not removing support to the interested tooth and, above all, to the neighbouring teeth, even for a future implantology;
- c. Greater operative simplicity;
- d. Reduced healing time;

The advantages against the ROE are:

- a. Not need an orthodontic device to be mounted;
- b. Not need of periodic fibrotomy;
- c. Reduced time of treatment and restraint with less number of sessions.

The advantages against the implantology are:

- a. Maintenance of the natural tooth;
- b. Less complexity;
- c. Sharply reduced treatment time or mostly similar;
- d. Easier achieving of a natural esthetic, especially in case of surgery on the anterior teeth;
- e. Creation of a "future site" useful for a following implant surgery, increasing the apical available bone for the primary stabilization of the implant and for obtaining a more adequate crown – radicular diameter to the future implant diameter; Last and not less important advantage compared to all the previous techniques is definitely the cost effectiveness, apart a better acceptance by the patients due to the less injury.

Theoretical background

PET is based upon the studies and the observations about the "dental reimplantation" [1-3], in fact it is very similar to the intentional reimplant, only that the tooth should not to be completely extracted from the dental socket, though it could happen and not cause any worsening of the prognosis, but simply dislocated, moved more coronally and then stabilized into the new position. The technique of surgical extrusion was first described in 2004 by Korean authors [4]. They performed their technique elevating a gingival flap. Ten years later was reported a case report of surgical extrusion of multiple teeth with crown–root fractures [5]. The peculiarity of the PET, conversely, is that it is a flapless technique. The periodontal ligament is teared when the luxation is performed but, having a good repairing regenerating potential, it heals and restabilizes the tooth in the new position in the time of 60 days. At the same time reforms a new epithelium connective attachment apparatus. More time is requested for the apical bone regeneration, but this has not any clinical relevance if the root length inserted in the bone is adequate. If an intentional reimplant roots, it is very likely that even a tooth treated with PET roots. Due his indications, a tooth to be treated with PET has always to be treated from the endodontic point of view, but this does not affects the repair potentiality of the periodontal ligament. The original protocol contemplates to defer the endodontic treatment after the periodontal healing, but someone prefer to perform it previously to reduce the possible infective complications in case of pulp necrosis or to remove the pain in case of pulp vitality.

Description of the technique

Plexis anaesthesia is performed both in the upper arch and in the lower one. It is preferable to avoid intra ligamentous anaesthesia to not cause ischemia of the periodontal tissues with possible suffering or necrosis of them. A fibrothomy is performed with very thin scalpels, then a very gentle, slow dislocation is done with equally thin levers (those created to extract roots to be replaced by an immediate implant are very suitable for this purpose). Also extraction forceps can be used very slowly always controlling the strength applied to not damage the alveolar bone edge until the tooth is mobilized. When the dislocation is achieved, the extrusion is automatic. In the original protocol of Dr. Guazzi the technique is performed without elevate any gingival flap, to reduce the most the suffering of the hard and soft tissues, even if are possible similar outcomes to be achieved with a surgical access.

Then has to be evaluated the extrusion obtained making the patient to occlude, as any occlusal trauma on the extruded root has to be avoided. To stabilize the tooth in the obtained position two sutures to be maintained for 10 days on the mesial and the distal papilla are enough to get a firm reimbursement of the soft tissues to the extruded root. The two sutured tight around the root make smaller the gingival circumference and avoid the reinstruction of the root into the socket. The authors never observed cases of reinstruction of a tooth treated with PET. It is possible to position a dental dressing or a resin/polycarbonate formed bite previously prepared. These devices are not necessary normally, it is enough to instruct the patient to not use for the mastication and to not brush for 4 weeks the side interested by PET.

Another advantage of the PET is that often it is not necessary to rebuild the abutment with root posts because the recovered height of the tooth is enough for a good retention of the crown. Normally it is not necessary to take antibiotics or analgesics, but it is useful to rinse with a mouthwash Chlorexidine 0, 12 based for 2 weeks.

Contraindications

General: Are the same contraindicating other oral surgeries: scompensed diabetes, serious coagulation troubles, biphosphonate assumption, ischemic cardiopathy etc.

Local: Too short rooted teeth not guaranting a long lasting stability are not candidate for PET, like curve rooted teeth that, being extruded, could divert too mesially or distally or laterally, so to make difficult a correct rebuilding of the abutment; occlusal patterns like deep bite or too short clinical crowns not achieving an adequate inter occlusal space such that allow the coronal repositioning of the root.

Complications

The most fearsome complication is the fracture of the root during its luxation. If it happens, it has to go on with a post extractive implant. A less frequent complication is the partial fracture of the alveolar ridge; its amount has to be assessed so to decide if to go on with PET or to extract the tooth and to change the procedure. Usually the PET brings excellent outcomes if the indications are observed and the described above technique is respected. Practically any failure, loosening or fracture has been noticed in a clinical experience of nine years.

Conclusion

The PET, as described, is not the unique solution in cases of non sufficient height of the crown, but it is a simple and effective option and certainly represents an additional possibility to be considered for the prosthetic treatment of teeth where, due to carie or fracture, the healthy dental margin is localized at a sub- or iuxtagingival level.

Conflict of Interest

The authors declare that any financial interest or any conflict of interest exists.

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