Volume 03, Issue 04 (September-October 2020), PP 06-16 **www.ijmsdr.org**
ISSN: 2581-902X

International Journal of Medical Science and Dental Research

The Different Means of Reintervation Infixed Prosthetics

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I. Introduction:

The dismantling of fixed prostheses may be inherent to a bad prosthetic design or then be part of a reassessment of the patient's oral situation following a change in the dental environment of the prosthesis, following a trauma for example, or simply the obsolescence of the latter. The outcome of this intervention is uncertain, and the patient must be informed of the risks involved. It must be done in the greatest comfort for the patient and preserve the integrity of the residual dental organ and the supporting tissues.

For this, the therapeutic decision will be made after a careful and precise clinical and radiological examination while trying to respond to the patient's wishes. To re-intervene we need a large number of materials and techniques. The goal of this work is to review the different means and all the techniques for a quick and less invasive loosening.

Definition:

The removal is according to W.H. LIE BENBERG a "challenge which allows to judge the intelligence, ingenuity and capacity of the practitioner, a challenge made even more difficult by the improvement of casting techniques" 1 The decision to choose whether to keep or destroy the prosthesis is based on a precise initial clinical examination. You must successfully assess the benefits or risks involved before making any clinical decision According to BARETY, "the processes are numerous, none are universal, but many are complementary" 2. Indeed, the removal of a unitary element does not use the same means as those used in the case of plural reconstructions with one or more root anchors. There are no codified protocols to apply. It is up to the practitioner to choose the option best suited to the case and to combine certain techniques to achieve the desired result.

The different means of removal**:**

- Without destruction of the prosthesis:
- ***Impact techniques***

***The crown remover[1,3,4,5,6,7,9]: fig1**

The crown remover is one of the oldest devices on the market to deposit a crown thanks to a shock effect. There are two types: one with a counterweight (Percussion is obtained by means of a counterweight which slides along a cylindrical rod. The disadvantage is that the heavy counterweight rotates around the rod which makes difficult to apply a targeted force.), and the other with a square rod (The change in the shape of the rod makes it possible to obtain an impact force that is better oriented due to the impossibility, for the counterweight, to turn.) The crown puller should not be used as a first intention, as it puts the tooth at too great risk (crack, coronary or radicular fracture).

Rather, it is used to test the retentive value of the crown. It makes more sense to sacrifice the prosthesis than to risk losing a supporting tooth. We can associate other techniques like that of the copper ring, the coping technique.

Fig 1: crown remover

-**The coping technique**consists of applying a self-curing resin with a brush to the vestibular and lingual surfaces of the crown. The two opposite regions will be joined by a thin layer of resin. A bulb is then added vestibular and lingual a few minutes later. The crown puller is then applied against the bulb, and a frank effort is exerted on the resin coping. Once the crown is loosened, the coping is carefully removed using tungsten carbide burs.

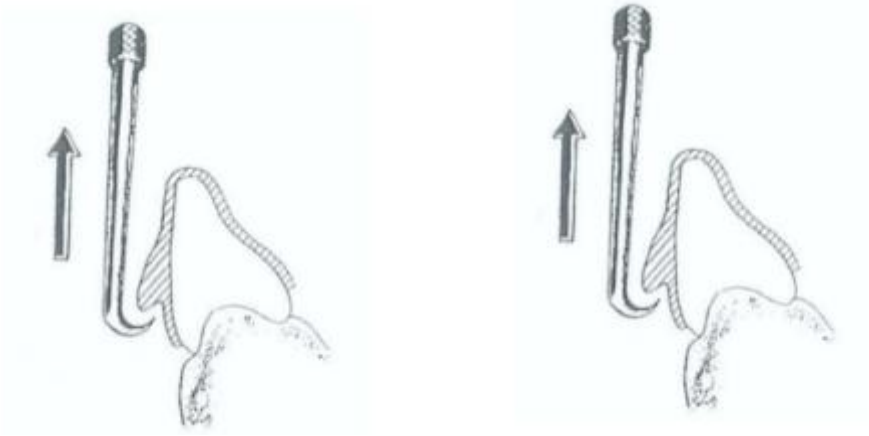

Fig 2: Application of self-curing resin then action of the crown puller. Extract JADA, vol 99, November 1979

-**The copper ring technique:** A copper ring with a diameter greater than the coronary part of the prosthesis is prepared by two opposite V-shaped incisions. Two holes, also diametrically opposed, are drilled with a round bur about 3mm from the edge. They receive soft Remanit wires of 3/10 mm, the ends of which are joined by a strand. The whole is tested and retouched at the level of the V incisions the ring is filled with self-curing resin, for ceramic or metallic prostheses, and softened Kerr paste for resin prostheses. After the material has hardened, the traction is carried out by repeated blows from the crown puller, the active part of which is placed at the level of the strand.

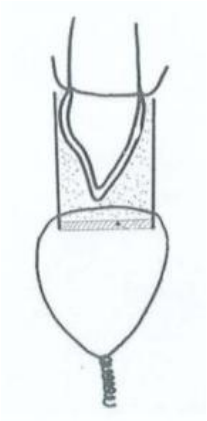

Fig 3 : Copper ring filledwithkerrpast . D. Rozencweig

*** The KAVO "CORONAFEX" pneumatic system: fig 2** Removal is obtained by the force given off by the compressed air supplied in the unit to the instrument; indeed, a ball is pushed from the handle to the tip of the instrument. The percussion thus produces a shock wave which will cause the decohesion of the cement. This percussion is obtained by digital pressure on the base of the coronaflex, the intensity is adjustable with a screw at the end of the handle. It is also advisable to start only with the minimum setting so as not to be surprised by the striking force. The manufacturer recommends using only 50% of the power to unseal a single unitary crown.

It respects the axis of insertion of the prosthesis and thus minimizes the risk of stump fracture. Indeed, the grip of the crown is done on the 2 sides thanks to the pince and the rider. It prevents destruction of the prosthesis which can therefore be kept as temporary for the rest of the treatment or be reused.

Fig 4: Coronaflex

*** The easy crown and bridge removereasy tooth system from HEICO[3,4,9,10]:**
It is a pneumatic system whichworkswithcompressed air. The shockwavethus causes the prosthesis to loosen.
The downside: Shaking, evenlessthanwith a manual crown wrench, canbeunpleasant for the patient. The hookmay slip and cause damage to the ceramic.

Fig5: System HEICO

***ATD bridge removalof ANTHOGYR[3,8,9,11]:**

This instrument is used for the mechanical removal of bridges, thanks to a shock wave which causes the homogeneity of the cement to be broken. The ATD removal bridge is based on the use of flexible wire end caps of different diameters which are passed between the interdental spaces and are supported on the underside of the bridge. These son tips have the distinction of having a low elasticity which allows them to transmit the entire force to the prosthesis. The metal cables are then connected to a square section crown wrench

Fig6: system ATD ANTHOGHYR

***The Safe-Relax d'ANTHOGYR[6,9]:**

Safe-Relax transforms the rotationalmovementtransmitted by the motorinto a series of shocksadjustable in intensity and frequency. Wethenobtain a series of controlled percussions withoutmanualrearming. Thesepercussions are of medium intensity, but their high frequencycan go up to 20 shocks per second.

Fig7: Safe relax System of ANTHOGYR

- ***The adhesive technic:***

***Stickum beagle:** This technique consists of using an easily kneadable adhesive paste used for the removal of temporarily sealed crowns. The downside is that it sticks to your fingers or gloves.

***Richwilltablet:** Richwill tablet is a flexible thermoplastic resin with strong adhesive properties in the form of a piece of "caramel". The major disadvantage is that it causes damage to the antagonistic teeth crowned or not due to non-selective adhesion.

Fig8: Richwill tablet technic

- ***Clips:***

*** Ellman's forceps:**
The Ellman forceps are a manual instrument, relatively close to the Furrer's forceps, with the differencethathere the jaws are not pointed but curved and flattened. In addition, this clamp does not have a clampingscrew.

*** Martin's clip:**
The Martin companymarkets 2 types of pliers: n ° 1163 and 1276, and whichwillmakeit possible to carry out a removalaccording to the pittingprinciple.
An orifice iscreated at the occlusal face of the cap to bedeposited. Wewill place in thishole the roundedbeak of the forceps, while the otherjawisfixed at the cervical edge of the prosthesis. The forceps are thentightened to obtain the mobilization of the crown.

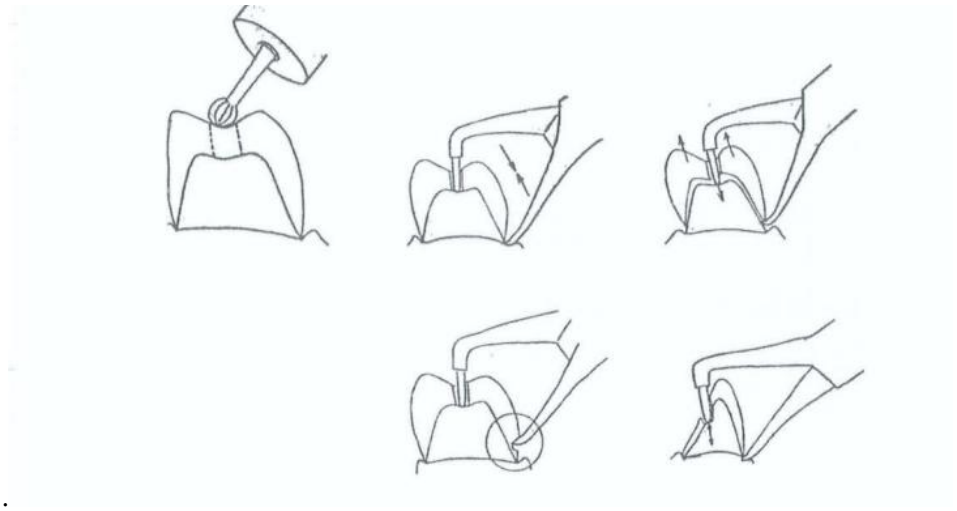

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Fig9: Martin Clip System

***Classical Clips :**

The ATWOOD screw or WEIL extractor:

The Atwood screw is a conical screw with a self-tapping thread activated by a key. It rests by its pitch of VIS on the element to be unsealed and by its end on the dental stump, it consists in that the practitioner makes a hole on the prosthetic element to be unsealed, at the level supposed to be the thickest of the occlusal surface (usually a cusp tip). The perforation made is narrower than the diameter of the screw to allow the thread to bite into the metal. This allows the greatest number of turns of the screw to be engaged in the crown to be unsealed. The screw is turned with a wrench with a large lever arm. By rotary movements, it comes into contact with the stump to lift (along the insertion axis) and thus unseal the crown.

The downside is that the tooth must be strong to withstand the pressure created by the screw.

Fig10: ATWOOD screw technic

« crown and bridge remover » of Rand, or Rand Extractor[2,9,13]:

The system of the "Rand extractor" or earring pliers, is a very rigid metal grip element and in the shape of a crab claw. There are 2 models, each provided with a micrometric tightening screw: one allows the grip at the level of the interdental spaces or bridge embrasures. The other allows tightening at the buccal-lingual cervical bulge. These elements are each provided at their upper part with an oval window allowing the insertion of the crown puller or pliers.

The disadvantage is the possibility of scratching the ceramic or deforming the cap at the cervical level.

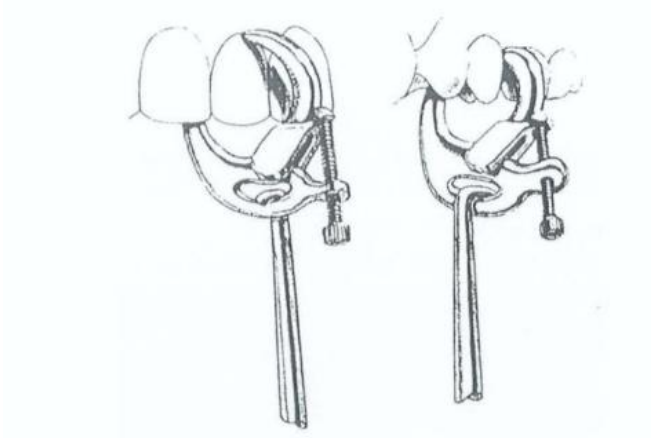


Fig 11: Rand-extractor coupled with a crown puller, Extract JADA, vol 99, November 1979

- **Ultrasound**

  Ultrasound is elastic vibrational waves; whose frequencies are between 15Khz and several hundred Mhz. Dental devices emit ultrasound at frequencies in the range of 25,000 to 32,000 Hz. Ultrasound, the purpose of which is to break the cohesion of the cement or of the adhesive for assembling the prosthetic element, will come to complement the various removal techniques mentioned above.

- ***WithDESTRUCTION of the prostheticelement:***
- ***Deposition technique withmilling: fig3***

The "sacrifice" of the prosthetic element is certainly the safest and least traumatic method to preserve the underlying tooth.

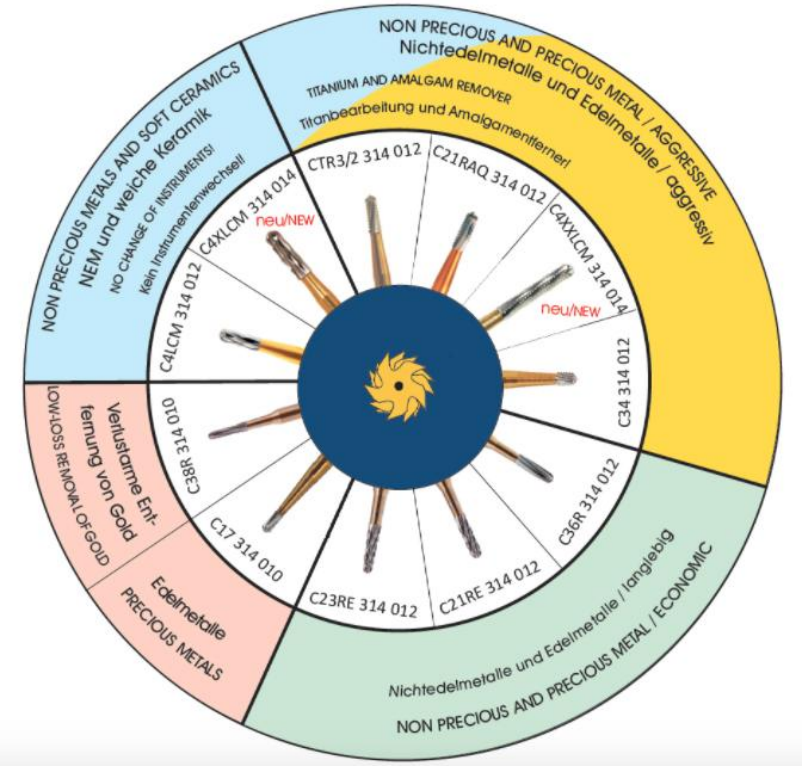
This method consists in separating by cutting, the prosthetic cap from the preparation on which it is fixed, while keeping the integrity of the prosthetic support, when we speak of bridge, we use the term cutting.

This technique is used when the prosthesis is deemed unusable even as temporary.

We can associate this technique with the removal of Dr. Christensen's crown from HU-FRIEDY

Fig 12: removalwithmilling

There is differentshape and different cutter structure depending on the type of material tobecut.



❖ Removal technique with disassembly**:**

***Leverage method[2,9,14,15]:**

This methodconsists in making a slit on the vestibular surface of the crown and inserting an instrument intoitsothatitcanexert a sufficient lifting force. The leverageissupported on the occlusal surface and causesloosening.

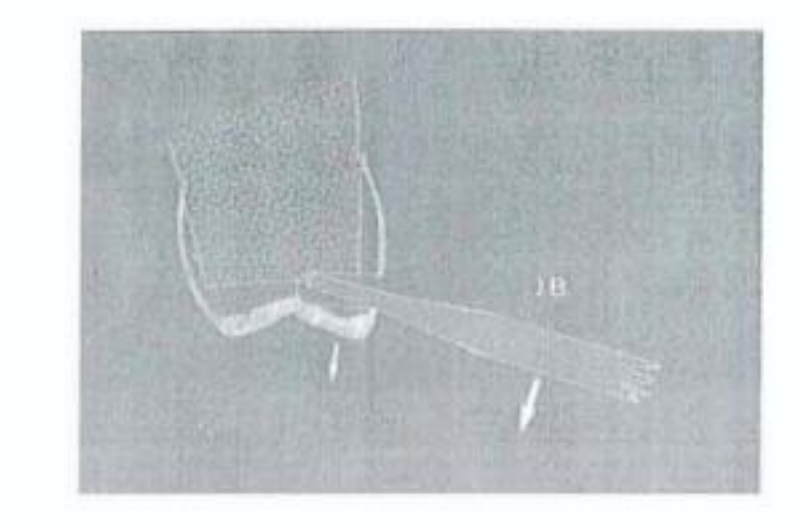


Fig13: Leverage method

***ScrexTechnic:**

This technique repeats the principle mentioned above, but to reduce the risks, a vertical trench will be added to the horizontal one. Thus, the oblique forces cause the deformation of the prosthetic part and no longer the fracture of the dental organ. The gesture performed by the practitioner is a rotational movement which has the effect of spreading the two metal edges.

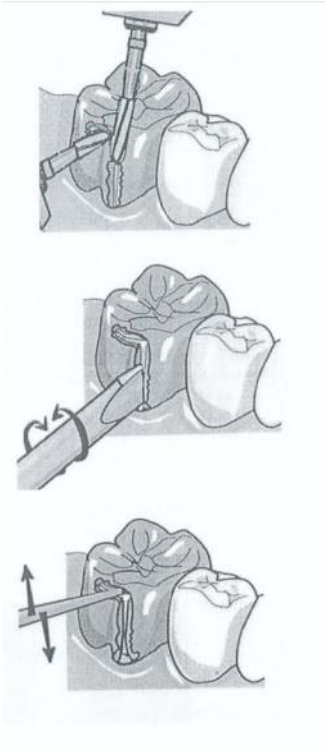


Fig14: Screx technic

*** Wamkeysystem of DENTSPLY:**

The loosening key is a manual instrument similar to an elevator or a syndesmotome, the working part of which is distinguished by an ellipsoidal shape which gives it the action of a cam. There are 3 sizes that allow you to cope with different contexts (more or less large tooth size, nature and configuration of the supportingtooth ...).

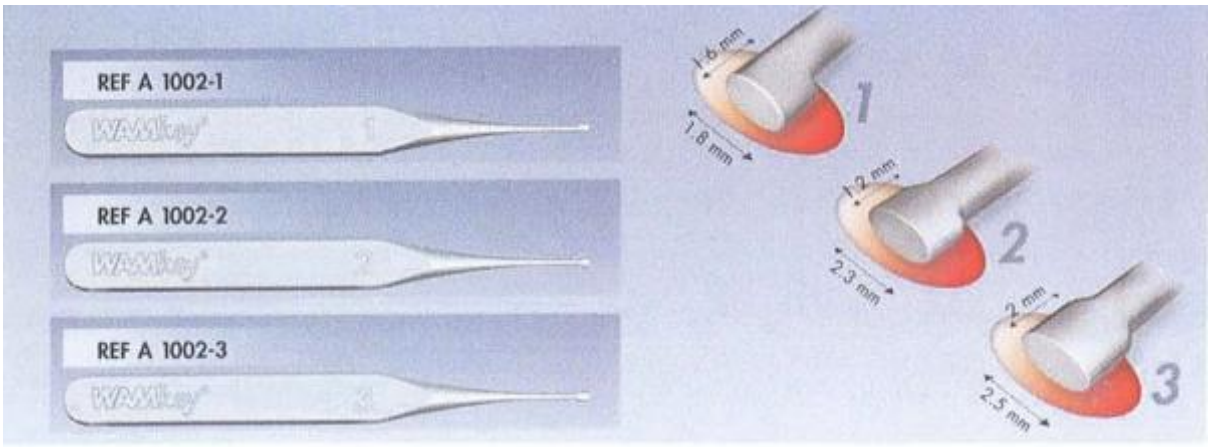


Fig 15: WamkeySystem

Case of coronoradicular, post and screwpost:

***scelled pin[17,18,19,20]:**

****pivot pullers**:

They are used in cases where the metal fragment has a graspable end. The pivot pullers have the function of removing this emerging part by pressing on the cervical surface of the root. Removal is done here by pulling. There are different systems: The Post Puller, the pivot puller from Anthogyr, The Ivory-Miniature from Martin, the pivot puller from Eggler, The Martin clamp n ° 1206, the Healthcoextracter clamp, the Gononsystem ,

** Extractors:

They act in the case where the emerging part of the post to be deposited does not offer sufficient grip.

They carry out a threading of the end of the broken tenon, to be able then to see out it using a jack. They act a bit like a "corkscrew", The method implies that the hardness of the post authorizes the calibration and threading operations, which limits their use with nickel chrome posts, there are several Clavulex systems, the Gonon system , Wam X system…

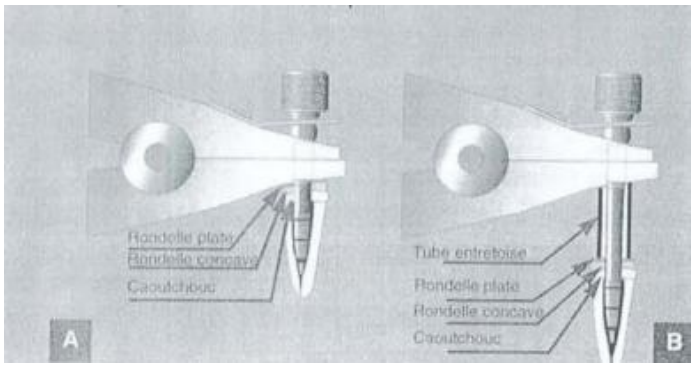


Fig15: Extractor of post

*** Case of striatedstuds type screw post:**
The removal of plastic material (amalgam, composite), in which the screwpost is trapped, must be done first and carefully. Indeed, the screw head must remain intact to be able to insert a manual key in the form of a small screwdriver. Anti-clockwise rotation is then carried out gently to disengage the screwpost.

*** Case of gluedstuds:**
It is very difficult to deposit this type of extremely hard post without risking fracturing the root. They should then be removed by milling to preserve the dental organ.

Conclusion:

The concepts of maintenance and progressive prostheses are an inherent part of the current practice of prosthodontics. This inevitably happens by removing the fixed prostheses. It is a difficult act that you have to know how to tackle on the technical level: by mastering the tools and gestures, but also on the psychological level: by providing the patient with good information on the stages and the risks involved. It will then be necessary to carefully study the clinical and radiological situation of the tooth and its environment before intervening. A certain number of hazards may appear during disassembly and it will be necessary, at each step, to be able to remedy them and find the appropriate solution. It is therefore a question of developing a real strategy where good knowledge of the clinical situation and experience will be particularly necessary.

Bibliographie :

[1.] LIEBENBERG W.H. Dépose des prothèsesfixées sans les endommager. Clinic (Paris), 1995, lQ, 6, 42 1-429
[2.] BARETY 1., LAURENT M., et al. Dépose des élémentsprothétiques fixes. Cah.Prothèse ., 1989, 68, 7-15'
[3.] APAP M. Déposerune couronne sans la détruire. Indépendentaire, 2004, 16, 56-6 1
[4.] DERRIEN G., JARD EL V. Le démontage des prothèsesfixées (Odontologie). Encycl. Med. Chir. (Elsevier,Paris), 23-30S-B-10(1999)
[5.] EXBRAYAT J., et al. Manuel de prothèsefixéeunitaire. Paris: Masson, 1993, 22 1p
[6.] GAT EAU P. Démontage des prothèsesfixées. I.D., 2002, 31, 2247-2250
[7.] KANTOROWICZ G. Réparation et dépose des bridges. Chir.Dent.Fr., 1972,99, 37-41
[8.] AN DREW V. L' ATD Dépose Bridge. Implantodontie, 1994 , 14, 87-88

[9.] RAOOT N., et al. Evolution des techniques de dépose des superstructures enprothèsefixée. ATO Art.Tech.Dent., 2002 , 11,3, 109-116
[10.] EID N. et al. Attitude clinique face au descellement parti el des bridges. RéaI.Clin., 2000, il, 3, 31S-324
[11.] BONTURY r.c. L'ATD dépose-bridge. I.D. , 1996, 32, 2367
[12.] BALDEN SPERGER R., et al. Le descellement. ActuaI.Odonto-Stomatol., 1977 , 119, 561 -578
[13.] BARETY 1., LAURENT M., et al. Dépose des élémentsprothétiques fixes. Cah.Prothèse ., 1989, 68, 7-15
[14.] ROUCOULES L. Descellementpartiel d'un bridge. 1.0., 1966, 48, 6, 571-577
[15.] VIGNON M., et al. Démontaged'uneprothèsefixée , comment démystifier la dépose des bridges? Rev. Odonto-Stomatol., 1986,12, 5, 349-3 55
[16.] BARETY J., LAU RENT M., et al. Dépose du tenon anatomique. Cah.Prothèse ., 1991, 75, 39-47
[17.] DOT O., BRUN ET A. Réinterventionenprothèsefixée. RéaI.Clin., 2000 , Il , 3, 30S-313
[18.] FERRARI 1.L., et al. Dépose des matériaux et des ancrages corono-radicu1aires. RéaI.Clin., 1996,1, 3, 291-304
[19.] FERRARI J.L., et al. Dépose des ancragesradiculaires. I.D., 1999, 29
[20.] VIGNON M., et al. Le descellement et le démontage des prothèsesfixées. la: Prothèsefixée :principe et pratique. Paris : Masson , 1993, p200 -207