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The ROSIN Extraction Lever For Upper Wisdom Teeth

A user report by:
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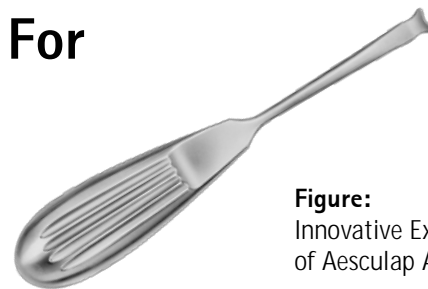


Figure:
Innovative Extraction Lever (DL069R)
of Aesculap AG, Germany

Keywords: upper 3rd molar, extraction, lever application

The difficulties encountered in the extraction of upper wisdom teeth are due to anatomic variants of the roots, with fine apices curved towards distal, and in some cases to the difficult access to the tooth crown. In this paper we present an extraction lever that by its shape and operation is specially adapted to the anatomic and topographical situation at the upper wisdom tooth. The extraction technique and the advantages of using the extraction lever are presented and discussed.

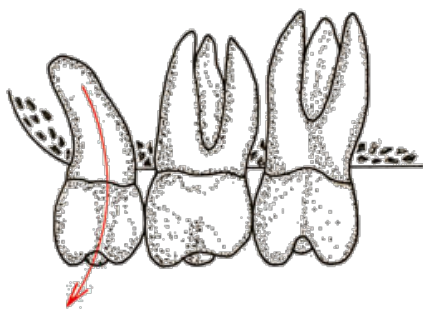


Fig. 1:
To avoid fracturing of distally curved roots, and the need to dilate the bone during the extraction, upper wisdoms would have to be luxated along a virtual arc towards caudal posterior.

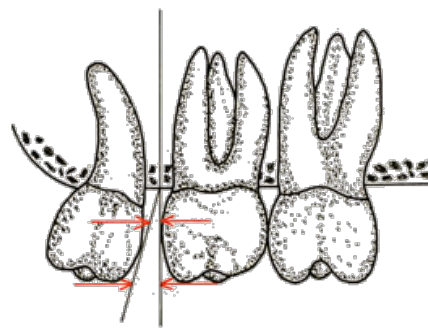


Fig. 2:
For a leverage luxation, an occlusal application point is preferable to a gingival one. The longer leverage paths allow operating with less, or more finely adjusted force applied (lever rule).

Extractions are routine procedures in dental surgery. The instruments and techniques used for this purpose are within relatively narrow specifications and can be regarded as fully developed. Nevertheless we must note that patients still regard the extraction of wisdom teeth (third molars, TM) as a notorious event. This can be attributed, to some extent, to the much-feared surgical removal of retained TMs. But the extraction of fully ruptured TMs can also be an unpleasant procedure for

patients and dentists, for such root fractures are made more likely by the wide anatomic variance, and more difficult to manage by the too poor access and visibility, than for other groups of teeth.^{4,6} As root fusion is common in these cases, the extraction of the upper TMs can be less difficult than the extraction of the other molars of the human dentition. On the other hand, the often-cited complication of tuber fracture^{1,2,3,4,5,6} and the connected discussion about the optimum instrumentation for extracting an upper TM – forceps^{4,6} or lever^{1,2,5} – indicate that the extraction of the upper TMs is fraught with a range of difficulties, arising from the particular anatomic and topographical conditions:



Fig. 3:
Rosin extraction lever for upper wisdom teeth. The rounded handle merges into a flat shaft. The working tip forms a 30° angle with the shaft axis

- Poor access to the tooth crown, especially if the latter does not reach the level of the occlusion plane and/or is slanted towards buccal
- Root(s) often (strongly) curved towards distal, in some cases with very fine apices
- The maxillary bone can be significantly weakened at the transition to the maxillary tuber, notably with very distinct TM roots, high position of the TM or strong pneumatization of the maxillary sinus.

Considerations concerning the instrument design and the extraction technique

The extraction lever described in this paper (manufactured by Aesculap, Tuttlingen) and the associated, special extraction technique were developed to allow the quick and atraumatic extraction of upper TMs with minimal risk of complications. The development was based on the following considerations:

- The roots of the upper TMs are often curved towards distal. To avoid fracture, or having to dilate the bone in order to overcome the extraction resistance, the teeth need to be luxated towards caudal posterior along a virtual arc (Fig. 1). This would not be possible with forceps.
- To luxate the tooth to posterior by means of a lever, the instrument should be applied at a point as far towards occlusal as possible. Because of the longer leverage thus achieved (lever rule), the dentist can operate applying less, or more finely adjusted force (Fig. 2).

As a result, a lever guided in occlusally and applied interdentally (Fig. 3, 4) is the best solution regarding the surgical technique, and allows an elegant approach to the crown of the TM, with good visibility.

Surgical method

Detaching the gingival

The extraction lever is designed so that the gingival sleeve can be detached from the tooth to be extracted in an easy and trouble-free way. Considering the aim to operate ergonomically and with high efficiency, it is significant that the extraction lever is already used at this early stage of the procedure. The lever is handled in such a way that the upper surface of the angled working tip faces the buccal or palatal surface of the crown. Now the gingiva can be detached by moving the cutting edge of the upward-pointing tip from mesial to distal (Fig. 5, 6). This technique also allows working the instrument distally around the tooth.

Applying the lever

With the patient's head slightly inclined to posterior and the mouth wide open, the working tip is inserted in the interdental space from occlusal, parallel to the tooth axes, so that the center of the cutting edge points to the contact point and the side tips reach into the approximal space from buccal and palatal (Fig. 7).



Fig. 4: Extraction of carious tooth 18 without antagonist tooth, prior to quadrant treatment with cast restorations. The teeth are prepared with build-up fillings. The extraction lever is guided in from occlusal and applied interdentally between 7 and 8.



Fig. 5: The lever can also be used for detaching the gingiva in an elegant and trouble-free way. View from buccal.



Fig. 6: The gingiva is detached from the tooth by moving the edge of the upward-pointing tip of the working end from mesial to distal. View from palatal.



Fig. 7: The angled working tip is inserted vertically and parallel to the tooth axes into the interdental space. View from buccal.

Stage 1

The lever is pushed to the level of the gingiva (Fig. 8). This is done with strong pressure towards apical, and with slight rotational movements around the longitudinal axis of the lever. In the process, the tooth is pressed towards posterior and the wedge-shaped cutting edge is forced into the space opened by the lever action. The two forked tips prevent the lever from slipping sideways. At the same time, the thumb and index finger of the left hand are engaged around the 2nd molar and the TM and in the lateral finger moulds of the working tip (Fig. 9).



Fig. 8:
By slight rotation of the handle around the longitudinal axis of the lever and simultaneous, strong pressure towards apical, the working tip of the lever is pushed to the level of the gingiva. View from palatal.



Fig. 9:
During the step outlined under Fig. 8, the thumb and the index finger of the left hand reach around teeth 7 and 8 and engage in the lateral finger moulds of the working end. In this way the lever is secured against lateral slipping.

Stage 2

Now the tooth is luxated towards posterior and buccal. For a right-hand upper TM this is done by counterclockwise rotation around the longitudinal axis of the lever; for a left-hand upper TM, the same movement is performed in a clockwise direction (Fig. 10). In this way the working tip is forced across the interdental gap. Due to the angulation of the working end, the palatal tip moves towards occlusal posterior, engaging under the dental equator and lifting the tooth from the alveole (Fig. 11). At this stage it would be incorrect procedure to simply tilt the lever and luxate the TM in a sagittal direction, since this could result in fracture of the maxillary bone, severing the maxillary tuber. As described, the lever handle must be rotated and the tip inserted in such a way that the tooth is luxated more towards buccal (Fig. 10). The 2nd molar thus serves not as the hypomochlion, but as a counter support for the lever.

Finally, although the complete luxation of the TM with the lever would be possible, the completely loose tooth is grasped with the forceps and safely removed from the oral cavity (Fig. 12).



Fig. 10:
The TM is completely luxated by rotation of the lever, not by tilting it over tooth 7. By turning the handle, the lever is inserted in such a way that the tooth is luxated more towards buccal.



Figure 11

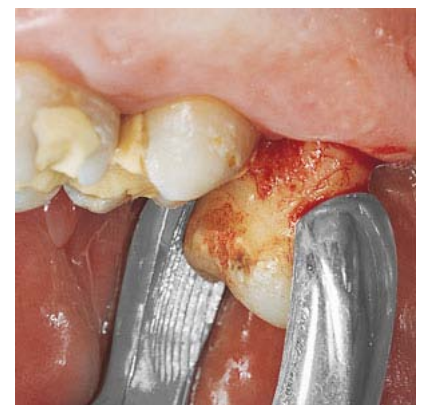


Figure 12

Clinical experience

Over a period of 4 months, the author removed 48 TMs with the extraction lever, of which 21 were upper right TMs and 27 upper left TMs. These extractions were all the cases of fractured upper TMs indicated for extraction, without pre-selection, encountered by the author in the course of his work at the polyclinic for dental surgery within the Zentrum für Zahn-, Mund- und Kieferheilkunde of Universität Greifswald during that period. The average extraction time, measured from applying the lever, through the detachment of the gingiva to the removal of the tooth from the oral cavity with the forceps, was approximately 90 seconds. Of the total of 48 extractions, there were two cases of fracture of the fine, distally curved apices. In one case the fragment was still connected to the tooth by the periodontal ligament; in the other, the fragment was found loose in the alveole and could be removed easily. No other complications were observed. Postoperative healing occurred without problems, in all cases.

Conclusions – clinical relevance

The indications for the ROSIN extraction lever are not limited to the extraction of upper wisdoms from closed rows of maxillary teeth. The lever and the technique described above can serve to extract upper TMs, usually quickly and trouble-free, despite the particular anatomic and topological conditions mentioned at the beginning. The application of the lever from occlusal to posterior and caudal offers the following advantages, reducing the risk of complications to the achievable minimum:

- Reduced risk of root fracture (Fig. 1)
- Preservation of the alveolar bone (Fig. 1)
- No soft tissue contusion.

The elegant approach from occlusal avoids frightening the patient by horrifying maneuvers like applying forceps or the buccal application of a BEIN lever. Luxation by forceps, which causes considerable discomfort to patients – as they have to counter the forceps movement, often with the help of an assistant holding the patient's head – is not necessary with the technique described here. When the ROSIN extraction lever is used, the patient does not feel or notice the luxation forces, as the adjacent row of teeth, especially the 2nd molar, which is also anesthetized, serves as counter support. The patient remains unaware of the manipulations, which must be regarded as the optimum one can achieve when it comes to tooth extraction.

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