Electrosurgery applications in dental practice

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Received : 01.09.2015
Review Completed : 25.09.2015
Accepted : 30.09.2015

Introduction

Electrosurgery is an extremely useful device which has wide applications in the performance of soft tissue dental procedures. As the name indicates, it involves the usage of electrical current which has been modified for use in dental soft tissue procedures. It provides very good hemostasis and hence is a good prospect for management of vascular lesions. The basic mechanism of action involves a conversion of electrical energy to thermal energy which produces the tissue changes observed.[1]

Electrosurgical Principles

The electrosurgical principles are electrosection, electrocoagulation, electrodessication and electrofulguration. Of use in dental surgery are electrosection and electrocoagulation only. Electrosection involves a cutting of tissues with an electrode which is heated by an electrical current. Elecctrocoagulation involves achieving hemostasis by producing a large area of thermal burn and coagulating the blood/ vessel wall in the site of application. It is more useful for venous and capillary bleeding as compared to arterial pulsatile type of bleeding. Electrodessication and electrofulguration are not used in dentistry and involve tissue changes by surface heating/ drying of the tissues.[2]

Electrocautery uses low voltage, high amperage, current to heat a surgical tip to cause tissue dessication, coagulation or necrosis by direct transfer of heat to tissues. Two types of electrosurgical devices are available: monopolar and bipolar devices. In a monoploar device, the patient body serves to complete the circuit between the active electrode and the neutral plate, whereas in a bipolar device, the circuit is completed between the two electrodes within the confines of the handpiece, thereby reducing the possibility of accidental burns for the patient.[3]

Electrosurgical Tip designs

The electrocautery device (Fig 1) has a variety of tips (made of fine tungsten) which fit into a handpiece and the cutting current and coagulation current can be modified depending on the nature of the lesion/ site being treated. The tip designs include needle / bent needle electrode, loop electrodes and ball / bar electrodes.

The needle and bent needle are used for cutting procedures , ball/ bar electrodes are meant for coagulation and loop (circular/ triangular) are meant for tissue contouring).[4] (Fig 2)

Indications for use of electrosurgery in dental practice: [Used for soft tissue procedures only][5]

1. Crown lengthening
2. Gingivectomy/ gingivoplasty
3. Operculectomy
4. Frenectomy
5. Excision of gingival epulis / vascular lesions / fibromas etc. (Fig 3)
6. De-pigmentation
7. Gingival troughing following crown preparation
8. Gingival polyp excision

Limitations of electrosurgery

1. Contra-indicated in individuals with cardiac pace-makers.[6]

2. Necrosis of bone/ cementum can occur if prolonged contact of more than 10-15 seconds ismaintained due to thermal damage.[7]

3. It has to be used with caution in sites with thin gingiva – high risk for gingival recession.[7]

Healing following treatment with electrosurgery is delayed if excessive charring happens during the procedure. In summary, the electrosurgery is a less known but useful tool for the management of common practice situations such as polyp excision / crown lengthening / gingival enlargement etc.

In summary, electrosurgery represents a handy tool for the dental practitioner and serves as a value addition in dental procedures. However, it should be used with caution due to its far reaching implications on the patient if not used correctly.

References

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Fig 1: Satelec Servotome: Monopolar Electrosurgery device

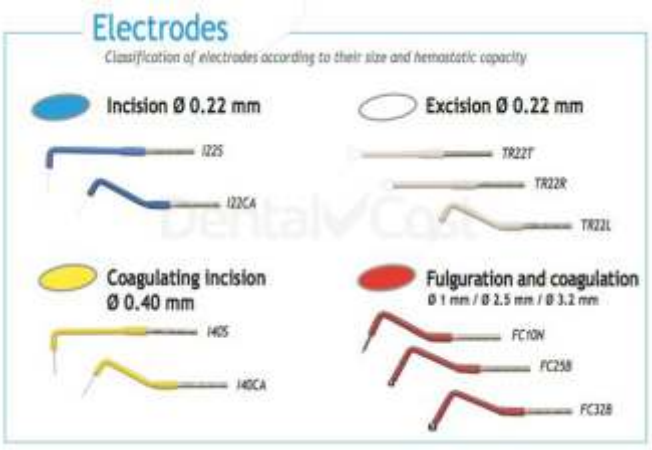

Fig 2: Electrosurgical tips with applications (Satelec)

Fig 3: Sample case of excision of gingival epulis