



Coblation wands

Balasubramanian Thiagarajan

Stanley Medical College

Abstract:

This article discusses the architecture of coblation wands used in otolaryngological surgeries. Wand happens to be the most important consumable of the coblation system. These wands are also expensive and meant only for single use. Hence this technology has a built in recurring cost factor.

Introduction:

There are different wands available for different surgical procedures. These wands include:

1. Tonsil wand
2. Laryngeal wand
3. Microlaryngeal wand
4. Nasal wand
5. Needle wands for tongue base reduction and turbinate reduction

Tonsil wand:

This wand is also known as Evac 70 wand. It has a triple wire molybdenum electrode. This triple wire electrode is very useful for tissue ablation. Its bipolar configuration suits efficient hemostasis. The shaft is malleable and hence can be bent to suit various anatomical configurations of oral cavity. It can also be bent so much that adenoids can be reached via the

oral cavity route under the soft palate. It has integrated suction and irrigation facility. Normal saline is used for irrigation purposes. Normal saline acts as a medium through which Radio frequency current passes causing release of plasma. This integrated irrigation and suction facility obviates the necessity of separate suction during surgical procedures.



Figure showing Tonsil wand

Tonsil wand happens to be the work horse of the entire system. It is also the most commonly used wand. The basic advantages of tonsil wand are:

1. Plasma generated by the electrodes are optimized for adequate tissue ablation
2. The depth of injury is very less and hence there is no collateral tissue damage

3. The temperature generated between the electrodes is 40-70° C. This temperature does not cause airway fire and it is hence safe to use.
4. The presence of multiple electrodes ensures quick and stable establishment of plasma layer, maintains the stability of the plasma layer and also maximizes the plasma layer.

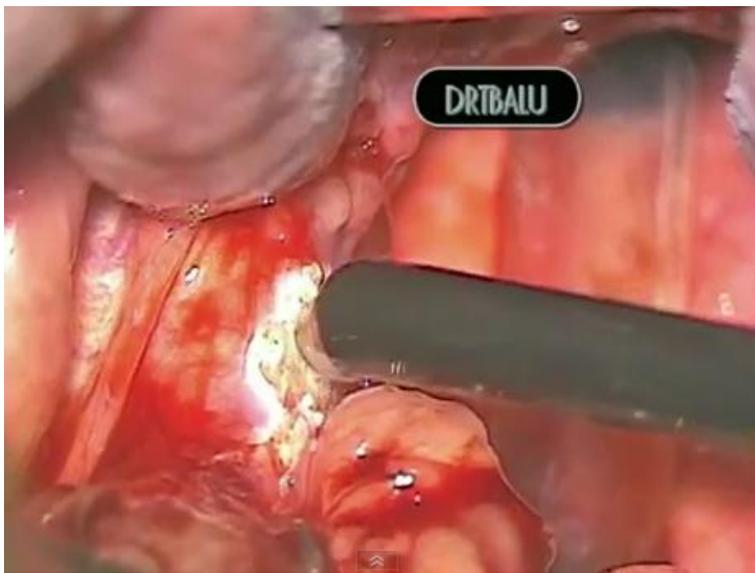


Figure showing tonsillar wand in action

Microlaryngeal wand:

This wand is designed for precise and controlled ablation of laryngo tracheal lesions. Its shaft is thin and long. It provides ablation, coagulation, suction and irrigation in the same set up. Its increased length facilitates tissue ablation from the anterior commissure of larynx and upper trachea. It also does not obstruct vision of the surgeon.

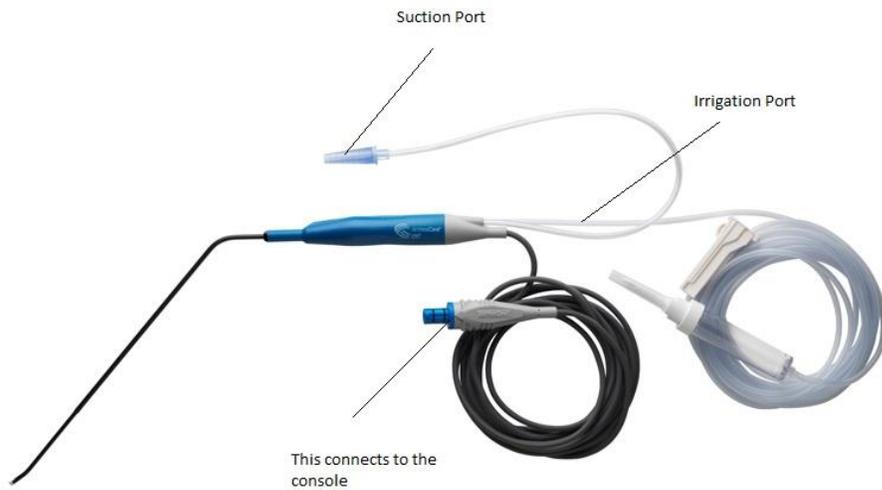


Figure showing Microlaryngeal wand

Laryngeal wands:

This wand is very useful for controlled ablation of bulky or sessile laryngeal lesions. It has built in ablation, irrigation, coagulation and suction capabilities. The length of this wand is suitable for ablating lesions from larynx and anterior commissure areas. Its curvature does not obstruct vision. It does not have the risk of air way fires which is possible with conventional electro surgical equipment.¹



Figure showing laryngeal wand in action

Turbinate reduction wand:

This wand is a needle type wand. Saline should be infiltrated into the turbinate tissue before performing the actual procedure. This wand does not have an irrigation portal hence the tissue needs to be infiltrated with a mixture of 2% xylocaine with 1 in 100,000 units adrenaline admixed with normal saline. These wands are also known as Reflex Ultra wands. These wands are designed to perform minimally invasive procedures. Sub mucosal channeling procedures can be performed using this wand². Reflex Ultra 45 is used for turbinate reduction³.

Tongue base reduction wand:

Reflex Ultra 55 wand is used for tongue base reduction and soft palate reduction. This is usually performed to treat snoring.



Figure showing Reflex Ultra wand

All these reflex ultra channeling wands have depth limiters. This helps in limiting the depth of sub mucosal penetration.

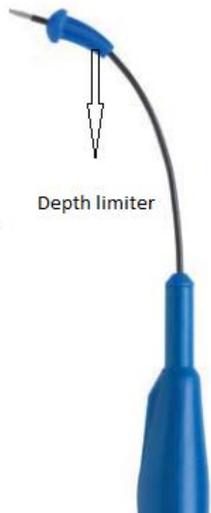


Figure showing Reflex ultra wand with depth limiter

Coblation wands can work in two settings:

1. Non plasma power setting
2. Plasma power setting

Differences between Non plasma and Plasma power settings:

Non Plasma power setting 1-5	Plasma power setting 6-9
No plasma layer is formed	Plasma layer is formed
Tissue not removed	Tissue removed
Deeper depth of penetration	Shallow depth of penetration
Lower voltages used	Higher voltages used
Temperature generated is more	Temperature generated is less
Cellular vibration / oscillation	Molecular dissociation

The color of Plasma glow generated at the tip of the wand varies depending on the medium used for irrigation. The tip of the wand glows yellow if sodium chloride is used as irrigation medium and orange if the irrigation medium happens to be potassium chloride solution.

Tips:

1. Copious irrigation with normal saline is a must
2. Colder the irrigating fluid better is the result (overnight refrigeration of saline packs is preferable)
3. Plasma power setting should be used for best results
4. Wand should not dig into the tissue
5. Wands are meant for single use only. Multiple uses not only fails to generate plasma but also causes increased incidence of wound infection
6. Wands should be handled with extreme care to make it last till the end of the case

References:

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2. Bhattacharyya N, Kepnes LJ. Clinical effectiveness of Coblation inferior turbinate reduction. *Otolaryngol Head Neck Surgery.* 2003;129:365-371.
3. Bäck LJJ, Hytönen ML, Malmberg HO, Ylikoski JS. Submucosal bipolar radiofrequency thermal ablation of inferior turbinates: A long-term follow-up with subjective and objective assessment. *The Laryngoscope,* 2002; 112: 1806-1812.