

# Harmonic Scalpel For A Bloodless Partial Glossectomy: A Case Report

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### SUMMARY

Tongue surgery is almost always complicated by intraoperative bleeding. Its rich blood supply especially from the lingual vessels makes the operative field bloody. Electrocautery has been widely used to replace cold scissors in order to achieve better hemostasis. The use of ultrasonic harmonic scalpel for glossectomy is still new in this country. We report a case of partial glossectomy using the harmonic scalpel in a patient who had a squamous cell carcinoma of the lateral border of the tongue.

### KEY WORDS:

*Tongue carcinoma, Harmonic scalpel*

### INTRODUCTION

The harmonic scalpel is an ultrasonic activated surgical instrument which includes scissors and hook. It works by generating a high-frequency harmonic motion of a metallic rod which eventually denatures proteins, cutting very effectively with less bleeding and thermal damage to the surrounding tissues. It is widely used in minimally invasive surgery involving the abdomen and thyroid gland, for cutting and hemostasis. Its usage in head and neck surgery for example in tonsillectomy, submandibular sialoadenectomy, and parotidectomy are relatively new. A case report regarding its use for glossectomy was published in 2000,<sup>1</sup> and few prospective studies have been reported. However the technique is still not widely popularized including in this country.

### CASE REPORT

A 30 year old gentleman presented with odynophagia of 6 months duration. It started with repeated accidental biting on the left side of the tongue. As the ulcer did not heal, he went for medical advice and was prescribed antibiotics, given dental advice and local analgesia. Despite that, the pain continued. It radiated to the ear and disturbed his sleep.

Oral examination showed an ulcer located at left lateral border of the tongue (Figure 1). It measured 3 x 2 cm. Tongue mobility was good and there was no neck nodes palpable. Punch biopsy was performed and revealed a well differentiated squamous cell carcinoma. Computed tomography and magnetic resonance imaging findings were consistent with T2 tongue lesion with a few subcentimeter lymph nodes at level II.

A partial glossectomy taking 2 cm of free margin was performed. The harmonic scalpel was used. The operative field was bloodless. The free edge of the remaining tongue was sutured with absorbable sutures. The entire tongue procedure took about 20 minutes, including primary closure of the remaining edge (Figure 2a, b and c). The usual spurting moment from the lingual artery was not experienced. Bilateral supraomohyoid neck dissection was carried out prior to the tongue procedure.

Frozen sections of lymph nodes and tissues from all margins were sent and all were negative for tumour. The patient had an uneventful recovery with tolerable pain controlled with simple analgesics.

### DISCUSSION

Glossectomy is surgical procedure a known to be associated with bleeding. Even in the experienced hands, bleeding from lingual vessels is unavoidable. Evolution of surgical instruments has made the surgery less bloody. Prior to this case, we used to use electrocautery technique for glossectomy.

A prospective study of 13 consecutive patients who underwent glossectomy (12 partial and one total) for carcinoma of tongue with the use of ultrasonic scissors was conducted in Queen Mary Hospital Hong Kong. All 13 glossectomies were completed using ultrasonic scalpel alone without the need to use ligation, plication, diathermy, laser, or clip, in resection and hemostasis. The median blood loss was 0ml; the median resection time was 49 minutes<sup>2</sup>.

For a conventional glossectomy with electrocautery, oral diet may be delayed because of postoperative pain induced by the thermal damage to the adjacent tissues. The harmonic scalpel is less damaging to tissue, just next to the steel scalpel and much less than other modalities such as monopolar diathermy, bipolar diathermy, and CO<sub>2</sub> laser. This may be due to the fact the amount of heat that is produced by the ultrasonic technique is much lower<sup>3</sup>.

In our case, the resection margin was outlined by using methylene blue. Some authors mark the outline with diathermy, but it is not done in this case. Bleeding was so much less and is hardly seen especially if the tongue mass is grasped bit by bit, compared to few big bites.

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Fig. 1: Lesion on the left lateral border of the tongue.



Fig. 2a: Using harmonic scalpel in partial glossectomy.

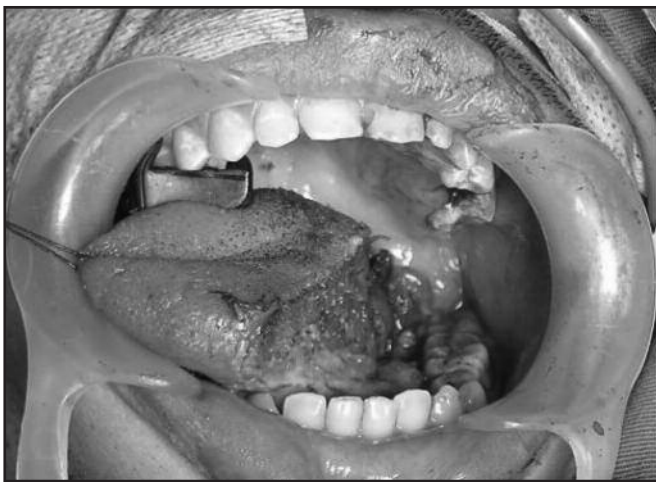


Fig. 2b: Tongue appearance after removing 1.5-2 cm surgical margin.



Fig. 2c: Primary closure with absorbable sutures.

Despite that, care should be taken when the lingual artery is encountered. Although the ultrasonic scalpel is said to be able to successfully control bleeding from lingual vessels with the diameter of 2 to 3 mm,<sup>2,4</sup> bleeding can occur if the lingual artery is partially grasped and tears before being totally sealed off. In that case, the vessel is grasped cross-sectionally and adequate time is given to make it seal. Some authors suggest that the lingual artery should be ligated when it is visible during the dissection<sup>5</sup>. The reason for bleeding in their series was that the scar had fallen off on the fifth and seventh post-operative day. In our case, the raw edges of tongue were closed primarily with absorbable sutures, thus avoiding healing by scab formation.

In term of cost, it is no doubt that the initial investment equipment cost and annual maintenance cost for ultrasonic scalpel are higher compared to the cold steel and diathermy. However, looking from the multiple perspectives which include consumable used, operative time and staff time cost, the use of ultrasonic scalpel for glossectomy is justified<sup>2</sup>. As the equipments are already available and routinely used on minimally invasive surgery, sharing of equipment among departments can be practiced.

## CONCLUSION

The use of ultrasonic scalpel in glossectomies should be popularized as it has been shown to reduce intra-operative bleeding, shorten the operative time, and more importantly benefit the patient in term of early resume of oral intake and less post-operative pain. As the device is relatively new in glossectomy setting, more experience need to be acquired to familiarize the otolaryngologist-head and neck surgeons with the equipment.

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