

Oral Soft Tissue Benign Lesions-Carbon Dioxide Laser as a Surgical Tool

GH. Mohd. Mir¹, K.P. Singh², Sachin Gupta³, Amit Manhas⁴, Ajaz Ahmed Malik⁵, Parmod Kalsotra⁶

ABSTRACT

Introduction: There is a wide range of oral soft tissue benign lesions, most of them amenable to surgical resection. Various modalities of Surgical resection are available including cold surgical resection, Cryo surgery and Laser resection. Laser resection is an ideal means of treatment of oral soft tissue benign lesions. Carbon dioxide laser is the most commonly used laser for surgical excision of oral soft tissue benign lesions. The aim of the present study was to evaluate the overall effectiveness of Carbon dioxide laser as a treatment modality of oral soft tissue benign lesions.

Materials and Methods: In the present study there were 65 patients with 67 oral soft tissue benign lesions including papilloma, mucocele, hemangioma, aphthous ulcers, Whartons duct calculi, ankyloglossia, fibroma, nicotinic stomatitis and pyogenic granuloma.

Results: In the present study, overall cure rate of 100% was achieved. There was no major intraoperative or postoperative complication. Four lesions had minor intraoperative bleeding which was effectively controlled.

Conclusion: Carbon dioxide laser is a very useful surgical tool in management of oral soft tissue benign lesions allowing excellent intraoperative visibility, haemostasis, better patient compliance, minimal chances of recurrence and is a time saving procedure.

Keywords: Oral Soft Tissue, Benign Lesions, Carbon Dioxide, Surgical Tool

INTRODUCTION

There is a wide range of benign lesions involving the oral soft tissue that are encountered in our clinical practice. A benign lesion of the oral cavity is a non-cancerous growth that does not spread (metastasize) to other parts of body and is not usually life threatening. Various surgical modalities of treatment are available for these lesions which includes cold surgical resection, Electrocautery, Cryo surgery and Laser resection. The CO₂ laser is an ideal means of excising benign soft tissue lesions^{1,2} Blood vessels smaller than 0.5mm diameter are sealed spontaneously, allowing excellent visibility and precision when dissecting through the tissue planes. There is minimal cellular damage adjacent to the plane of excision. This facilitates good wound healing, and it also means that the specimen can be removed without distortion, enabling the pathologist to provide an accurate histological diagnosis. Even large laser wounds heal with good functional results.²⁻⁴

Carbon dioxide (CO₂) laser surgery, has become the treatment of choice in many medical institutes, offering rapid and precise tissue dissection, reduced bleeding and post operative pain, low morbidity, minimal scarring and wound contracture and more importantly excellent patient acceptance.⁵⁻⁷ The aim of this study was to assess the usefulness of CO₂ Laser in management of oral soft tissue benign lesions.

MATERIAL AND METHODS

65 patients with 67 oral soft tissue lesions presenting to ENT OPD (Table 1) were treated by CO₂ laser in Deptt.of ENT and Head and Neck Surgery, SMGS Hospital, GMC Jammu. This group was followed up for a period of 2-5 months (Mean 3 months).

37 patients were males and 28 were females. Two patients were having twin lesions, one patient having bilateral Whartons duct calculi and the other one having two papillomas. In case of nicotinic stomatitis and aphthous ulcers laser vaporization was done while as all other lesions were managed by laser excision and specimen was sent for histopathological examination. All the lesions were treated under local anaesthesia using 1% xylocaine with 1:100,000 adrenaline after sensitivity testing. The CO₂ laser was used in continuous mode at an output power setting of 15-20W. Defocussing of the laser beam for haemostasis was achieved by elevating the focus of the handpieces a few millimetres above the tissue surface or by an adjustable lens in the micromanipulator. All laser treatments were done by handpiece technique. The laser beam was applied to the oral soft tissue in non-contact treatment mode through handpieces with side suction port attached. The wound left after excision of lesion was not sutured and was left open to heal by secondary intention. Patients were prescribed antiseptic mouth wash, oral cephalosporin to decrease the chances of wound infection, improve healing and NSAID (Diclofenac) for analgesia. After treatment, the patients were seen for follow up after 1 week, 1 month, 3 months and 5 months.

STATISTICAL ANALYSIS

Microsoft office 2010 was used for statistical analysis. Descriptive statistics like mean and percentages were used for data analysis.

RESULTS

Sixty five patients, with a total of 67 lesions, were treated for cure. The Carbon dioxide laser treatment was instituted after taking an informed written consent. This study was undertaken

¹Resident, Department of ENT, SKIMS Medical College Hospital, Bemina, Srinagar, ²Associate Professor, ⁶Professor, Department of ENT and Head and NECK surgery, SMGS Hospital, ⁴Lecturer, Department of Anaesthesia, GMC, ³Assistant Professor, Department of ENT, ASCOMS and Hospital, Jammu, ⁵Consultant, Department of ENT, Health and Medical Education J and K, India

Corresponding author: Gh. Mohd. Mir H.No. 138 Punzwa Villagam Distt. Kupwara Kashmir

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S. No.	Lesion	No. of lesions	Percentage
1	Papilloma	25	37.31%
2	Mucocele	22	32.84%
3	Hemangioma	7	10.45%
4	Aphthous Ulcers	5	7.47%
5	Whartons duct calculus	3	4.48%
6	Ankyloglossia	2	2.98%
7	Fibroma	1	1.49%
8	Pyogenic granuloma	1	1.49%
9	Nicotinic Stomatitis	1	1.49%
	Total	67	100%

Table-1: Type of lesions

after getting the institutional ethics committee clearance. Four lesions including one papilloma, one mucocele, one haemangioma and ankyloglossia had minor intraoperative bleeding which was effectively controlled by defocussing the laser beam, silver nitrate cauterisation, Electrocautery and tying respectively. One patient with papilloma had an infected wound at one week follow up which was managed by debriding and antibiotic coverage, however this lesion showed delayed healing. Patients with submandibular calculi were managed with calculus removal and marsupialisation of duct. There was no stricture formation in these cases. Patient with nicotinic stomatitis showed recurrence and Second sitting laser treatment was needed. All the other lesions responded to single laser treatment. None of the lesions had significant postoperative bleeding. One patient with hemangioma had severe pain at first postoperative day which was managed by injectable NSAID and topical lignocaine jelly. Mucosal healing was complete at three weeks postoperatively except for one lesion of papilloma which showed delayed healing and one case of nicotinic stomatitis which showed recurrence on first treatment. At a mean follow-up of three months, all the patients had complete mucosal healing with normal appearing mucosa, with no residual/ recurrent lesion. Patient with Fibroma located adjacent to right upper third molar (figure 1) was an elderly male, having the lesion for past six months. This lesion was managed by laser excision (Figure 2) and had no intraoperative and postoperative bleeding. Follow up period of this patient remained uneventful. Patient with right side buccal mucosa papilloma (Figure 3) was managed by laser excision and at one week follow up the lesion was covered with healthy slough with mild perilesional edema. This patient showed complete healing at three weeks.

DISCUSSION

Oral soft tissue benign lesions are the non malignant conditions of the oral cavity which needs to be managed properly with safety of treatment as priority. The usual modalities of treatment for oral soft tissue benign lesion have been scalpel excision, electrocautery or cryotherapy. The carbon dioxide laser has certain advantages over the scalpel and cryoprobe in the management of oral soft tissue benign lesion,⁸ especially where large areas of epithelium are involved. Laser can control bleeding^{8,9} both during and after the operation and the surgeon has excellent visibility during the operation.⁸ In our study four lesions had minor intraoperative bleeding which was effectively controlled. There was no case of postoperative bleeding. Laser



Figure-1: Fibroma located adjacent to right upper third molar.



Figure-2: Immediate post laser excision of fibroma in same patient.



Figure-3: One week follow up of Papilloma right side buccal mucosa, excised by Carbon dioxide laser.

safety precautions were taken and all laser treatments were done in separate theatre with signboard. Protective eyeglasses were used by the surgeon, operating staff and patient during the procedure. Wounds were left open to heal after laser treatment and no suturing was done, except in one case for hemostasis. Following laser treatment epithelial regeneration is delayed, and wounds take longer to re-epithelialize than following excision surgery with sutures¹⁰, Wound healing was complete at three

weeks, except in one case of papilloma having an infected wound and nicotinic stomatitis which showed recurrence and second sitting laser treatment was done.

The CO₂ laser offers several advantages over conventional surgical methods and combines many of the attributes of the other techniques, both as a bloodless scalpel¹¹ and as a method of destroying tissue. These advantages are well recognized and include immediate tissue destruction, bloodless dissection, clear view during surgery, shorter operative time, minimal instrumentation and little damage to adjacent tissues.¹²⁻¹⁵ In our study the duration of laser was 3 to 8 minutes (Mean 5 minutes). Dissection with the laser is precise^{16,18} with minimal collateral damage.¹⁷ Laser has decontaminating and bactericidal properties on the tissue¹⁹, therefore there is reduced need for antibiotics. Only one lesion had an infected wound postoperatively, which was managed by debridement and antibiotic coverage. There are less chances of recurrence following excision with Carbon dioxide laser as compared to scalpel excision.²⁰ Laser excision in vascular lesions had no major bleeding, depicting the excellent hemostatic property of Carbon dioxide laser. Most of the patients reported only mild pain postoperatively except one patient with hemangioma who had severe pain. Patient compliance was excellent with minimal morbidity. Overall 100% cure rate was achieved with minimal intraoperative and postoperative complications.

CONCLUSION

Keeping in view the excellent results which were achieved in the present study in CO₂ laser treatment of oral soft tissue benign lesions, numerous advantages of CO₂ laser over other surgical techniques and less rates of recurrence and other complications as compared to other surgical methods, CO₂ laser should be more routinely used in management of oral soft tissue benign lesions.

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