



CRYOTHERAPY IN MANAGEMENT OF ORAL LESIONS USING LIQUID NITROGEN –A CASE STUDY

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ABSTRACT

Aim of the study to Evaluation of the efficacy of cryotherapy as a treatment modality for Oral lesions
Objectives: to evaluate the post- operative clinical outcome of oral lesions after treatment with

cryotherapy, with respect to

- Post- operative wound healing.
- Recurrence of the lesion

Results: There was no slough formation in 46.7%(7) of the patients on 1 stweek post treatment and 53.3%(8) of the patients had slough formation. After 2 weeks post treatment 46.7%(7) of the patients had fair amount of granulation tissue formation and 53.3%(8) of the patients had a good amount of granulation One month after treatment there was fair epithelization in 53.3%(8) of patients and 46.7%(7) of patients had good epithelization. There was recurrence of the lesion in 13.3%(2) after 2months and 86.7%(13) of them had no recurrence. , Low complication rate, minimal volume of tissue destruction, Particularly suited to extensive superficial lesions. **Conclusion:** Cryosurgery is the use liquid nitrogen were extreme cold is produced to destroy abnormal tissue. Cryosurgery is very safe, easy to perform and relatively inexpensive technique for treating various oral lesions in out-patient clinic it is very useful for oral lesion as the oral mucosa. . In this study the open method used to treat lesion with cryogen spray using liquid nitrogen has shown significantly good results in achieving complete regression of the benign and premalignant lesion of oral cavity .

KEYWORDS : cryotherapy, liquid nitrogen, premalignant lesion

INTRODUCTION :

Cryosurgery is local destruction of tissue by freezing. Cryotherapy has long been noted as a good technique that, when used correctly, can reduce pain and swelling and destroy lesions with little scarring(1). Tisse damage by cryotherapy involves several mechanisms. It has been determined that most tissues freeze at -2. 2°C and that the temperature must fall below -20°C for cell death to occur. The treatment of more aggressive cancers in the oral cavity may require repetitive freeze cycles at temperatures of at least -50 °C or more for tissue necrosis to occur. During the freeze cycle as the temperature drops, it is believed that extracellular water undergoes crystallization. In addition, membrane lipids harden take place at low temperatures decreasing cell resistance to shrinkage.

Extracellular stores of water diminish, as the electrolyte concentration increases. In order to counteract this concentration gradient, intracellular water moves out of the cell, and this water becomes involved in the crystallization process. As intracellular ice formed, remains trapped within the cellular membrane. As a result of these processes, intracellular electrolytes reach toxic levels, which become lethal to the cell. During a slow thaw cycle, cells at the periphery of the cryolesion will take up excess electrolytes. To equalize this gradient, water enters the cell and lead to swelling and lysis. Further re- crystallization may contribute to cellular damage, however, this phenomenon may be avoided if cells are thawed rapidly.(2)

White lesion is a non specific term used to describe any

abnormal area of oral mucosa that on clinical examination appears whiter than the normal tissue. It is usually slightly raised, roughened or of different texture from the adjacent normal mucosa (eg. frictional keratosis, leukoplakia, chronic hyperplastic candidiasis, Linea alba buccalis,). This normal colour of mucosa may turn into white due to increased thickness of the epithelium with increased production of keratin (hyperkeratosis) and production of abnormal keratin and imbibition of fluid by upper layers of mucosa. (10)

The main advantages of cryosurgery include absence of bleeding, low incidence of secondary infection, minimal scarring and pain and low treatment cost . (9) In our study we describe the use of cryosurgery in management of the oral lesions , followed by post operative healing and recurrence of the lesion

OBJECTIVES

To evaluate the post-operative clinical outcome of oral lesions after treatment with cryotherapy, with respect to

- Post- operative wound healing.
- Recurrence of the lesion

MATERIALS AND METHODS

Method of collection of data

This study was conducted in the Department of Oral and Maxillofacial surgery, Adhiparasakthi Dental College &Hospital with a sample size of 15 lesions.

- Informed/written consent was taken from the subjects/ caretakers.
- Routine, pre-surgical Haematologic investigations were done.

Inclusion Criteria:

- Patients who diagnosed with benign or premalignant oral lesion
- Lesion size more than 1cm
- Patient willing for cryotherapy
- Patients under ASAI / ASAII category

Exclusion Criteria:

- Patients diagnosed with oral malignant lesions.
- Patients not willing for cryotherapy.
- Medically compromised patients



1st month post operative showing complete



Fig 1. Cryocan



Fig 2.cryospray



Fig 3. Armamentarium



Pre operative mucocoele seen in the ventral tongue region



Intra operative



1st week post operative showing sloughing

RESULTS :

The present study was conducted to evaluate the efficacy of cryotherapy as treatment modality for oral lesion, to evaluate the post operative clinical outcome of oral lesion after treatment with cryotherapy with respect to post-operative wound healing and recurrence of the lesion. 15 patients who was affected with oral lesion either benign or pre-malignant lesion of size more than 1cm, were randomly selected from out-patient to evaluate the effectiveness of the cryosurgery method of treating oral lesion with liquid nitrogen after obtaining ethical clearance. The age of patients ranged between 22 yrs -52 yrs with 46.7 % of male and 53.3 % of female. The overall mean age of the study population 33.6. In this study the open method was used to treat the lesion by direct application of liquid nitrogen with cryogun spray, all subjects selected on the basis of inclusion criteria. Among 15 patients, there were 5 mucoceles lesions, 2 traumatic fibroma, 1 leukoplakia, 2 erythroplakia, 3 lichen planus, 2 Aphthous ulcers were seen. The site of occurrence of the lesion varied in different subjects the lesions were present on the buccal mucosa, floor of the tongue, upper vestibule, lower vestibule. Post-treatment follow up was done at 3 rdday, 1stweek and 1 stmonth and 2ndThe results were evaluated statically with the help of Descriptive statistics and NPar tests: chi-square test, kolmogorov-smirnovtest.

On the 3 rdday after treatment 46.7% (7) of them had slight pain, 26.7% (4) of them had mild pain, 20% (3) of them had severe pain and 6.7% (1) of them had very severe pain.

One week after treatment 66.7% (10) of the patients had no pain and 33.3% (5) of them left with slight pain. The pain score was significantly different from post-operative score through 1 stweek. The post-operative and 3 days pain score was significantly higher than 1week Swelling on 3 rdday after treatment 66.7% (10) of the patients had slight swelling and 33.3% (5) of them had mild swelling.

On 1stweek post treatment 86.7% (13) of them had no swelling and 13.3% (2) of the patients had slight swelling.

There was no slough formation in 46.7% (7) of the patients on 1 stweek post treatment and 53.3% (8) of the patients had slough formation.

After 2 weeks post treatment 46.7% (7) of the patients had fair amount of granulation tissue formation and 53.3% (8) of the patients had a good amount of granulation One month after treatment there was fair epithelization in 53.3% (8) of patients and 46.7% (7) of patients had good epithelization.

There was recurrence of the lesion in 13.3% (2) after 2months and 86.7% (13) of them had no recurrence.

DISCUSSION :

cryosurgery have many advantages such as minimal general disturbance to the patient, particularly well accepted by children and elder patients, Low complication rate, minimal volume of tissue destruction, Particularly suited to extensive superficial lesions, Treatment may be repeated as often as

necessary without increase in scarring, offers quality management of wide areas of premalignant change, May be used as an alternate to surgery and/or radiotherapy in palliative tumor control , Cryosurgery is a very safe, easy to perform, and relatively inexpensive technique for treating various oral lesions in an out-patient clinic.

Difficulty in judging the extent of the lesion can lead to involvement of an inadequate amount of tissue, use is minimally confined to surface lesions of no more than a certain depth, surgical access is required for deeper lesions. The depth of destruction is limited although the base of the lesion is refrozen after excision of frozen tissue. Certain tissue seems to have a greater resistance to freezing than others, cryosurgery is non -specific in its destructive effects. In lesion of tongue the procedure can limit its functions. Healing is slow, Extensive cryosurgery procedures may produce considerable scarring. Following healing by secondary intention, loss of normal anatomy can lead to limitation of mouth opening, speech disturbances and prosthetic problems, as in the case of widespread keratoses, after extensive cryosurgery severe pain can be troublesome and narcotic analgesics may be required. If a biopsy is not taken prior to cryosurgery, the true nature of the lesion may not be found.

Complication categorized as immediate complication includes bleeding, blistering, edema, pain, vascular headache, vasovagal syncope. Delayed complications include excessive granulation, infection is rare but possible with delayed healing tendon rupture due to deeper freezing on extensor surface offingers, ulceration, temporary complications include altered sensation may occur when damage in particular nerve, More profound freezing causes Wallerian degeneration which is followed by regeneration, as the nerve sheath architecture remains intact. This is also the reason for reduced sensation following cryosurgery, caution is required with lesion over nerve trunks. Peripheral nerve fibers may be painful following moderate freezing of adjacent structures, possibly due to the action of cellular breakdown products, hyperpigmentations may occur, increased risk with aggressive freezing hypertrophic scarring may occur, Scarring of facial skin if freezing is done for longer than 20 – 30 seconds. Healing occurs with reduction in pigmentation in such cases. Pyogenic granuloma rarely occurs. Permanent complications may include alopecia, atrophy, cartilage necrosis, hypopigmentations.

There are some more contraindications such as cold intolerance, cold urticaria, cryoglobulinemia, dysfibrinogenemia, agammaglobulinemia, Raynaud's and collagen diseases, pyoderma gangrenosum, patients undergoing hemodialysis or immunosuppressive therapy, patients with platelet alterations or with multiple myeloma(1). After all cryosurgery in treating oral lesions overweighs with its advantages.

CONCLUSION

Cryosurgery is the use liquid nitrogen were extreme cold is produced to destroy abnormal tissue. Cryosurgery is very safe, easy to perform and relatively inexpensive technique for treating various oral lesions in out-patient clinic it is very useful for oral lesion as the oral mucosa is humid which makes it an ideal site for freezing. With recent development of better equipment this mode of therapy appears to have a promising role in the management of benign mucosal lesion, more reasonable with adequate success, the procedure is relatively more acceptable and has shown to have, faster recovery. Though cryosurgery have some difficulties like portability of the cryogenic agent and storage of highly volatile material, it require special storage container for short-term storage and canister for dispensing the liquid from the container during its use, its advantages are numerous, this

technique provide a bloodless field , less pain when compared to conventional surgery, anesthesia is optional, excellent cosmetic results , low cost, low risk of infection, minimal wound care, no need of suture removal, no work or sports restrictions, short preparation time, useful in pregnancy. In this study the open method used to treat lesion with cryogen spray using liquid nitrogen has shown significantly good results in achieving complete regression of the benign and premalignant lesion of oral cavity.

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