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EFFICACY OF CARNOY'S SOLUTION IN TREATMENT OF ODONTOGENIC KERATOCYST

Dr. Anand Mangalgi	Reader Department Of Oral And Maxillofacial Surgery HKE's S Nijalingappa Institute Of Dental Sciences And Research Kalaburgi
Dr Supriya Patil	Reader Department Of Conservative And Endodontics HKE's S Nijalingappa Institute Of Dental Sciences And Research Kalaburgi
Dr. Sowmya T*	MDS Oral And Maxillofacial Surgery *Corresponding Author
Dr Aishwarya Manthale	Assistant Professor Department Of Oral And Maxillofacial Surgery ESIC Dental College Kalaburgi
Dr Viquar Ahmed	Associate Professor Department Of Oral And Maxillofacial Surgery K B N Medical College ,Kalaburgi

ABSTRACT

Background of the study : Odontogenic keratocyst(OKC) is one of the most commonly encountered odontogenic entities and requires special consideration because of its known aggressive behaviour and tendency to reoccurance. Literature suggests that application of carnoy`s solution after enucleation as adjuvant had shown decreased recurrence and morbidity. **Objective:** The purpose of the study is to evaluate of efficacy of carnoy's solution in treating OKC adjuvant to surgical treatment. **Methodology:** 10 diagnosed patients of Odontogenic keratocyst (OKC) who underwent enucleation along with application of carnoy's solution were assessed clinically and radiologically for reoccurrences over a period of one year. **Results:** This study compromised a total of 10 patients of which 8 were male (80%)and 2 female (20%) ranging age between 22 years to 68 years with a mean age of 42 years. In this study all the lesions were located in the mandible, most frequently in the body (30%), ramus (30%), body and ramus (30%), body and angle (10%).one patient had parasthesia which resolved over a period of eight months . No evidence of reoccurrence was found over a period of year. **Conclusion:** Enucleation along with adjunctive treatments like application of carnoy's solution reduces the risk of reoccurance in patients with OKC

KEYWORDS : (Odontogenic Keratocystokc), Enucleation , Carnoy's Solution

INTRODUCTION :

The term " odontogenic keratocyst" is coined by philipsen in 1956. OKC was given its name because it demonstrated keratinization of the cystic lining. It is an epithelial intraosseous, distinct, odontogenic cyst that originated in the oral and maxillofacial region. It has distinct traits like high recurrence rates, rapid infiltrative growth, and defined histological markers[1,2].Due to its aggressive and infiltrative behavior, WHO redesignated OKC as Keratinizing cystic Odontogenic Tumor (KCOT) in 2005. Since there was no strong affirmation to rationalize to label OKC as a neoplasm, WHO recategorised OKC as a cystic entity in 2017[3]. OKC is the Second most prevalent cysts of odontogenic origin (10–12% of all odontogenic cysts).OKC is recognized to have male predilection around 1.6:1. Patients with KCOT range in age from 7-83 years old, with two peaks. The first peak occurs between the ages of 25 and 34, and the second between the ages of 55 and 64[4,5].

Various surgical approaches for treating KCOTs have been introduced over the years, with conservative and aggressive treatment procedures being the most common. Enucleation, with or without additional therapy choices, marsupialisation, and decompression, with or without secondary adjuvant treatment, are examples of conservative treatment procedures[6].Since the chances of reoccurance is more in OKC, surgical treatment alone is not effective. The surgical treatment is focused on eliminating all residual epithelial fragments. In order to achieve this, a mild, judiciously penetrating, and cauterizing agent like Carnoy's solution is utilized. It has a mean bone penetration depth of 1.54 mm, with an application time of 5 minutes. (Carnoy's solution's composition is 3 ml of chloroform, 6 ml of absolute ethanol, 1 ml of glacial acetic acid, and 1 g of ferric chloride)[7].The purpose of the study is to evaluate of efficacy of carnoy's solution in treating OKC adjuvant to surgical treatment.

MATERIALS & METHODS :

A prospective study included 10 diagnosed patients of Odontogenic keratocyst (OKC) reported to the department of Oral and Maxillofacial surgery. All the patients underwent enucleation and placement of carnoy's solution for 3 minutes.All the patients were followed up periodically with postoperative radiographs to observe any recurrence of the lesion and regeneration of the bone defect.Patients were followed on 1week, after 1month ,6 months and 1 year post operatively and assesd clinically for pain and swelling.

RESULTS:

This study compromised a total of 10 patients of which 8 were male (80%)and 2 female (20%) ranging age between 22 years to 68 years with a mean age of 42 years. In this study all the lesions were located in the mandible, most frequently in the body (30%), ramus (30%), body and ramus (30%), body and angle (10%).All the cases were treated by enucleation followed by application of carnoy's solution. All the patients were followed post operatively for 12 months. After 1week post operatively patients were evaluated for clinical manifestations like pain, swelling, wound dehiscence. Over the course of the first week following surgery, there was statistically significant reduction in pain and swelling. One patient had post-operative lip paresthesia on the side that had undergone surgery, but it gradually subsided over the course of eight months.No any signs of wound dehiscence and delayed healing. At one month, six months, and twelve months after surgery, all patients were routinely checked for any radiographic or clinical indications or symptoms of recurrence. Final radiographs after 12 months follow up show good bone formation in all cases. All the 10 cases show no recurrence during the follow up periods.

Fig 1: preoperative OPG

Fig 2 : OPG at 1 year post operative

DISCUSSION :

Shear had re-emphasized that OKC shows increased proliferative activity & high recurrence tendency and stressed on association of OKC with the GorlinGoltz syndrome/Nevoid Basal Cell Carcinoma syndrome (NBCCS). Some of these OKCs had association with the PTCH 1 gene mutation and increased immunohistochemical expression of proliferation markers Ki 67 and presence of PCNA (Proliferating cell nuclear antigen marker of cell replication) and p53 in KCOT. All this evidence led to change in nomenclature by WHO in 2005[3]. This shift in tumor category suggested change in management protocol for OKC, which created a lot of skepticism, and the concept was not widely accepted, with the reason being not all OKCs possess identifiable PTCH mutation. Researchers have suggested that marsupialization can revert the fragile cystic lining epithelium to normal oral mucosa or from parakeratin to orthokeratin type. So, in 2017, a WHO expert panel declared that there is no strong affirmation to rationalize to label OKC as a neoplasm, and therefore, Odontogenic Keratocyst-OKC should be put back in cyst category and the term keratocystic odontogenic tumor (KCOT) was eliminated from the new classification[8,9].Rate of reoccurrence of OKC found to be 13-62%[10]. Review of the literature suggests that recurrence rate is relatively low with aggressive treatment, whereas more conservative methods tend to result in more recurrences. To minimize invasiveness and recurrence, the most effective treatment option appears to be enucleation of the KCOT and subsequent application of Carnoy's solution. .It is assumed that carnoy's solution eradicates epithelial rests from the cyst wall. Its average depth of penetration is 1.54mm after 5 mins of application[11]. This study was conducted to evaluate the effectiveness of using Carnoy's solution as a post-enucleation adjuvant in the treatment of keratocystic odontogenic tumour. Utilising Carnoy's solution has the goal of completely removing any epithelial remnants from cyst walls that could lead to recurrence. The patients' clinical complaints, lesion location, radiological appearance, and post-operative clinical and radiographic indicators of recurrence were all assessed. Study done by Gosau et al[12], Guiliani.M[13] proved that rate of reocurrance reduced in patients treated with enucleation combined with adjunctive therapy .In our study not even one reocurrance was noticed over a period of one year.

CONCLUSION:

Based on results obtained from our studies we can say along with enucleation performing adjunctive treatments like application of carnoy's solution reduces the risk of reoccurance in patients with OKC

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