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Managing Glandular Odontogenic Cyst: Optimizing Surgical Workflow With Root Canal Therapy.

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I. Introduction:

Glandular Odontogenic cyst (GOC) a rare cyst of Odontogenic origin was foremost discussed extensively by Gardner[1] in 1988 as mucus producing odontogenic cyst. GOC was earlier as Mucoepidermoid Odontogenic cyst, Sialo odontogenic cyst by Sadeghi et al and Garnder et al respectively. The term Sialo was removed from the terminology by WHO in the year 2023 as the association with Salivary gland was not proved. The extensive study conducted by

Chrcanovic and Gomez [2] of the published cases in literature including 169 cases, GOC presented more preferably in the Anterior Mandibular region with Slight male Predilection and often crosses the Midline with increased Prevalence at 5th decade. On Radiographic examination due to expansile nature there is bony expansion with or without cortical perforation, displacement of roots of the involved teeth. The Histopathological features described by Gardner the cyst is lined by Stratified Squamous epithelium with varying thickness, presence of hobnail cells, mucicarmine positive material present in the epithelium, prominent mucous cells and in some occasions the epithelial cells are arranged in spheres referred as Epithelial Spheres.[1] Due to the infiltrative nature GOC is considered as an Aggressive lesion. In Literature the treatment of GOC ranges from Cyst enucleation to radicle procedures like Marginal Mandibulectomy or Segmental resection. In advent with emerging technologies, Cryotherapy is used as an adjunct after Cyst enucleation.

The aim of the report is to emphasize the usage of Conservative method by cyst enucleation with chemical cauterization presided by Root canal therapy and Orthograde filling of Mineral trioxide Aggregate (MTA).

II. Case Report:

A 44-year-old male patient reported with a chief complaint of Pain and Swelling in the Right Anterior Mandibular region. The Swelling persisted for 1 month and progressively increased to present size with no associated fever or pus discharge. On Extra Oral examination Facial Asymmetry was noted in the Anterior mandibular region more persistent over the right side (Figure 1). On Palpation swelling was firm on palpation and fixed to underlying tissue. No lymph nodes were palpable. On Intra oral examination swelling was noted from right anterior region extending till the molar region involving buccal and lingual side. On palpation perforation was noted buccally. On Aspiration Pus was obtained and on cytology cystic lining was identified. On radiographic examination well defined radiolucency crossing the midline noted with corticated border extending from Anterior to posterior mandible in the right side with thin buccal and lingual cortex. Perforation was noted in the buccal cortex with displacement of teeth. (Figure 2) Incisional biopsy was done and histopathological features were Stratified squamous epithelium with focal epithelial plaques, spherules and micro cysts with Hobnail cells strongly suggestive of Glandular Odontogenic cyst in the mandibular region. (Figure 3) Cold test was done to check Vitality test using Endo Ice and the results were 44 45 showed normal response, 43 42 33 32 showed no response and 31 41 showed delayed response. The treatment plan was to perform Root canal therapy from 45-33 with Orthograde MTA followed by Cyst Enucleation and Curettage under General Anaesthesia with Chemical cauterization. The Endodontic procedure performed was After rubber dam isolation (Figure 4), access cavities were prepared on 33, 32, 31, 41, and 42. Working length was established using an apex locator (Root ZX, J. Morita, Japan) and confirmed radiographically. (Figure 5) Biomechanical preparation was done using ProTaper Gold rotary files up to F3 with 2.5% sodium hypochlorite and 17% EDTA irrigation. Calcium hydroxide paste was placed as an intracanal medicament for 7 days. Following the removal of medicament, MTA (ProRoot MTA, Dentsply Sirona, USA) was placed orthograde up to the apical third to ensure a hermetic apical seal and to manage any periapical communication with the cystic lumen. (Figure 6) After MTA setting, canals were obturated using gutta-percha and resin-based sealer (AH Plus). Composite resin restorations were placed coronally to prevent reinfection. Surgical management involved Cyst Enucleation and Curettage under General Anaesthesia. Following Cyst Enucleation, chemical cauterization was done with Modified Carnoys

solution (Figure 7). The specimen was sent for post operative biopsy and the results were Glandular Odontogenic cyst in accordance with the Pre operative biopsy. The Patient was under regular follow up. On periodic reviews wound gaping was noted in relation to the anterior region and to avoid infection the cavity was packed with Povidone Iodoform gauze pack which was changed on a regular basis. After three months of follow up there was secondary granulation tissue noted and reduction of the gaping. (Figure 8) On subsequent follow ups patient had no clinical signs of recurrence or infection and satisfactory bone healing was noted. (Figure 9)

III. Discussion:

Terminology of Sialo-odontogenic cyst was given by **Gardner**. **Padayachee and Van Wyk** described the lesion to be presenting with histopathological features of both Botryoid odontogenic cyst and Mucoepidermoid tumour.[3] Glandular Odontogenic cyst presents predominantly in the anterior mandibular region with slight male predilection. This is in accordance with our case report.[4,5]

Speight & Rautava formulated a criterion for diagnosing GOC with essential features being Radiolucent lesion involving tooth bearing region with multilocular presentation and Desirable features being histopathological features of Epithelial lining with papillary projections, hobnail cells and Micro cysts or ductlike structures. The histopathology and radiographic features of our patient depicted the quoted features which confirms the diagnosis.

Glandular odontogenic cyst known for its aggressive nature poses a challenge in the management perspective. The recurrent nature depends upon the locularity noted in radiograph with multi locular being more recurrent and involvement of cortical perforation[7].Depending on the size of the lesion and proximity to periapical region the treatment modalities are tailor made to achieve favourable outcomes. The envisioned treatment plan for performing Endodontic therapy prior to surgery is to ensure disinfection of the Root canals of the involved teeth and create a favourable environment for periapical healing.

The use of MTA as an orthograde apical filling material was crucial due to its superior biocompatibility, sealing ability, and capacity to induce periapical tissue regeneration[8,9].

Studies have demonstrated the role of MTA in managing cases with periapical communication and open apices[10]. Moreover, successful outcomes have been reported when MTA is used orthogradely to achieve an apical barrier in cyst-associated lesions[11].

In Surgical perspective there is recent advances of using Cryotherapy provides chemical cauterization efficiently and case report discussed by **Espinazo Ganchozo** highlights the use of Cryotherapy with no reported recurrence. Cryotherapy requires higher machinery, in case of fabrication of carnoy's solution is economically feasible and easier to prepare. There are fewer comparative studies to prove the efficacy of reducing the recurrence in cystic lesion with the use of Carnoy's solution and Cryotherapy.

Irrespective of the treatment option utilized it is always necessary to have periodic follow ups to monitor the recurrence.

IV. Conclusion:

This case reports highlights the use of Conservative management of Glandular Odontogenic cyst with adjuvant therapy-chemical cauterization with Carnoy's solution and the use of Ortho grade MTA treated preoperatively which will enhance the periapical healing. Long term studies are required to shed more light in the use of newer adjuvants and biomaterials which aid in healing and simultaneously reducing the recurrence rate.

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Figures:

Figure 1: Swelling Noted Over The Anterior

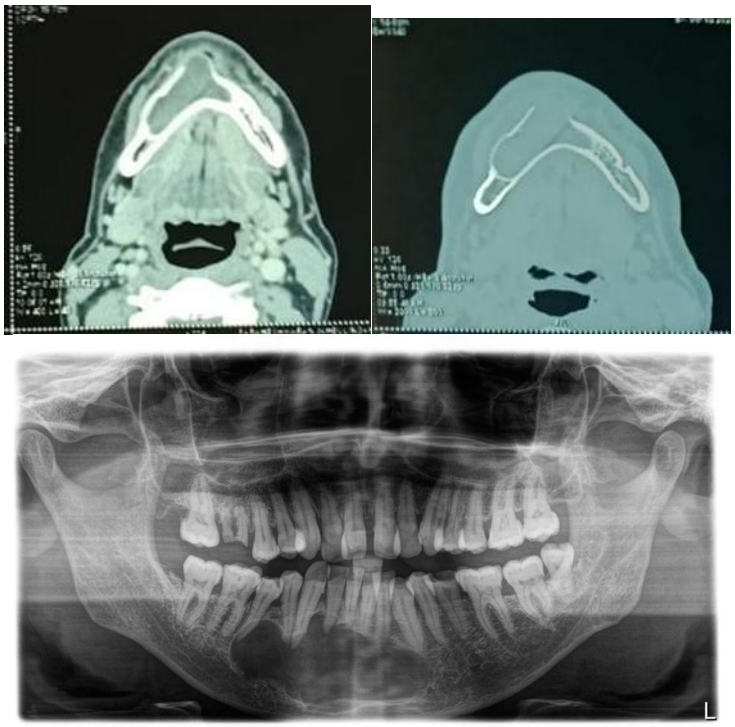

Figure 2: Radiographs Showing Well Defined Radiolucency With Corticated Border Involving The Buccal And Lingual Cortex.

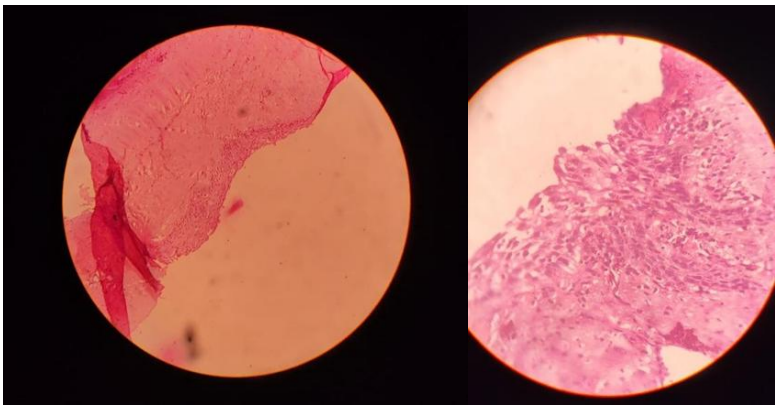

Figure 3: Histopatholgical Features Of Hobnail Cells, Stratified Sqaumous Epithelium Of Variable Thickness, Spherules And Microcysts

Figure 4: Isolation With Rubber Dam

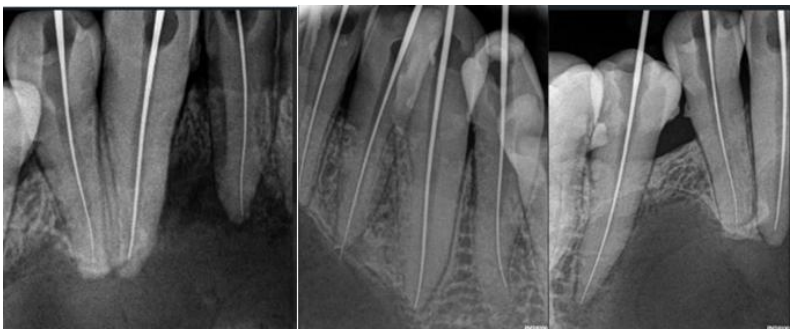

Figure 5: Working Length Determination

Figure 6: Orthograde Filling Of MTA

Figure 7: Cyst Enucleation Followed By Chemical Cauterization With Carnoys Solution

Figure 8: Post Oeprative Follow Up (Healing Of Wound Gaping By Secondary Intention)

Figure 9: Radiograph After 9 Months Of Follow Up (Significant Reduction In Size)