

# Integrated Approach to Anterior Mandibular Cyst Removal and Implant Placement: A Clinical Perspective – Case Report

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## ABSTRACT

**Background:** Edentulous anterior mandibular regions are frequently restored with dental implants. However, underlying lesions may remain undiagnosed on conventional imaging. **Case Presentation:** A patient presented with an edentulous anterior mandible seeking a permanent prosthetic solution. OPG showed no abnormalities, but CBCT—advised due to anterior mandibular pain—revealed a large radiolucent lesion. The lesion was enucleated, the defect grafted, and reinforced using titanium mesh and collagen membrane. Histopathology confirmed a radicular cyst. After healing, four implants were placed, restoring aesthetics and function. **Conclusion:** CBCT imaging and a multidisciplinary approach enabled detection, surgical management, and successful prosthetic rehabilitation in a previously unsuspected cystic lesion.

**Keywords:** Edentulous mandible, radicular cyst, CBCT, titanium mesh, bone graft, collagen membrane, implant placement, cyst enucleation, radicular cyst.

## INTRODUCTION

Cystic lesions in the anterior mandible often go undetected, especially in edentulous regions, due to a lack of symptoms or limitations of traditional imaging like OPG. With the rising popularity of implant-supported prostheses, early diagnosis of such hidden lesions is crucial. This case report illustrates how advanced imaging and a well-coordinated surgical and prosthetic plan led to the successful management of a large radicular cyst and eventual implant rehabilitation.

## CASE REPORT

### Patient Presentation

A middle-aged male patient reported to our clinic with an edentulous anterior mandibular region, seeking a permanent, fixed dental solution. He had no systemic illness and appeared clinically normal, though he described mild, persistent pain in the lower front jaw.(fig1 & 1A )



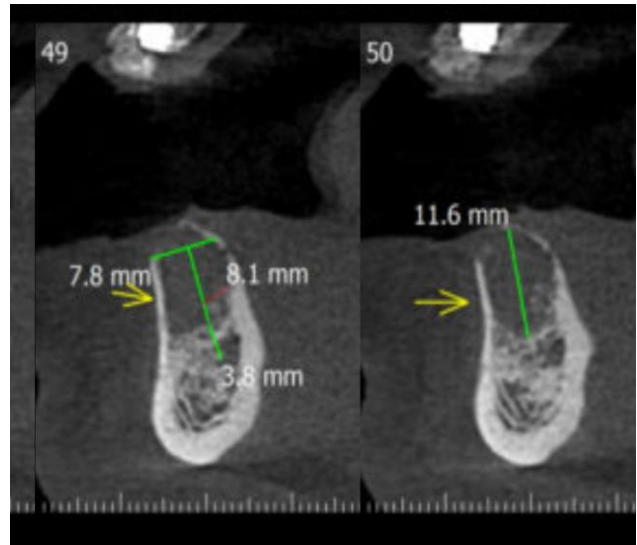
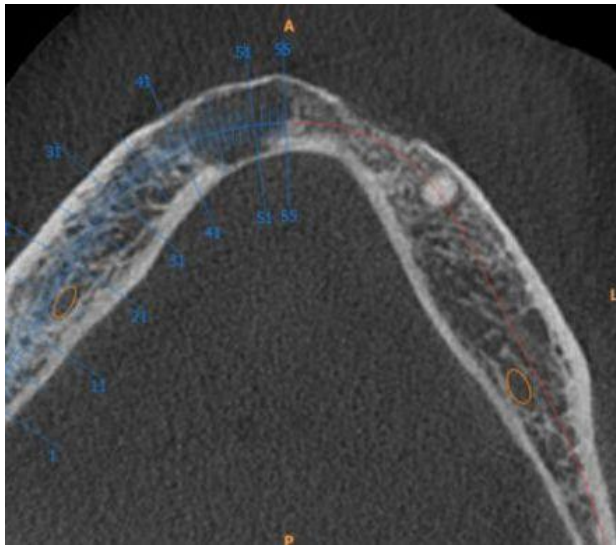
**Fig 1: PRE OP IMAGE**



**Fig 1(A) - PRE OP INTRAORAL image**

### **Radiographic Evaluation**

An initial orthopantomogram (OPG) showed no clear evidence of cysts or tumors. However, considering the patient's symptoms, a CBCT scan was advised. The CBCT revealed a large, well-defined radiolucent lesion in the anterior mandible, extending horizontally between the canine regions, suggestive of a cyst. (FIG2)



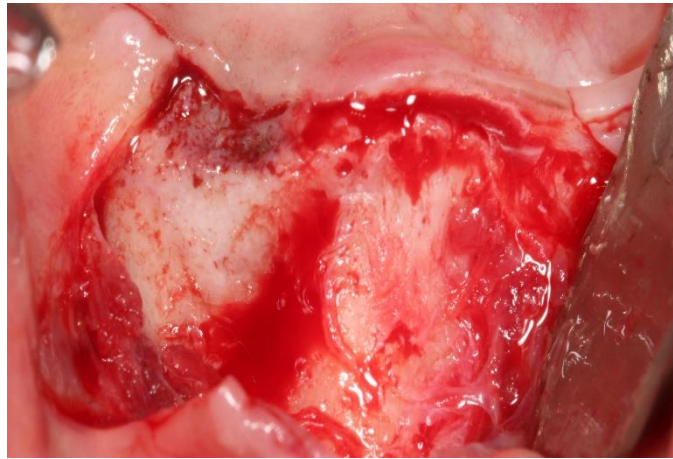
**Fig 2: CBCT reveals a huge radiolucency.**

### **Preliminary Diagnosis**

A cyst / tumour was considered due to the lesion's size and radiographic characteristics. Surgical intervention was planned for both diagnosis and treatment.

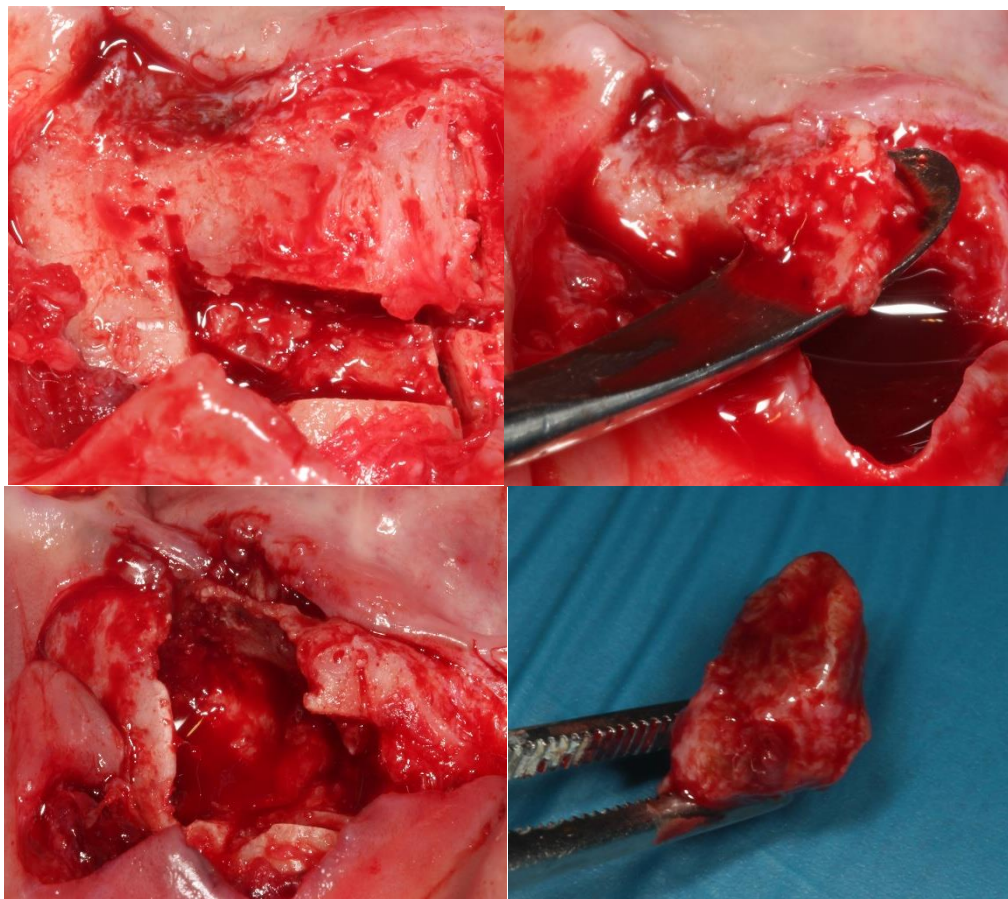
### **Surgical Management**

- **Anesthesia and Access:** Local anesthesia was administered. A crestal incision with vertical releasing incisions was made to raise a full-thickness mucoperiosteal flap.(FIG3)



**Fig 3: incision and flap raise**

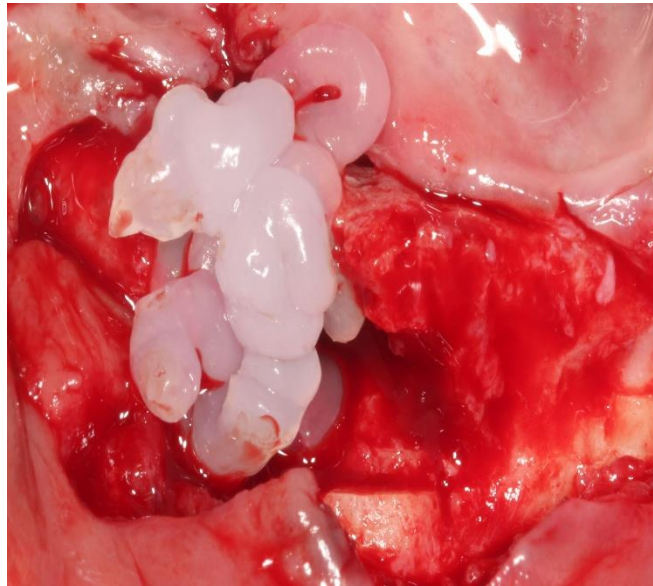
- **Osteotomy and Enucleation:** using an using a piezoelectric unit, Osteotomy was performed to access the lesion. The cystic lesion was carefully enucleated, and the cavity was thoroughly irrigated and debrided to remove all residual cystic lining. (FIG4)



**Fig 4: osteotomy and enucleation of cyst.**

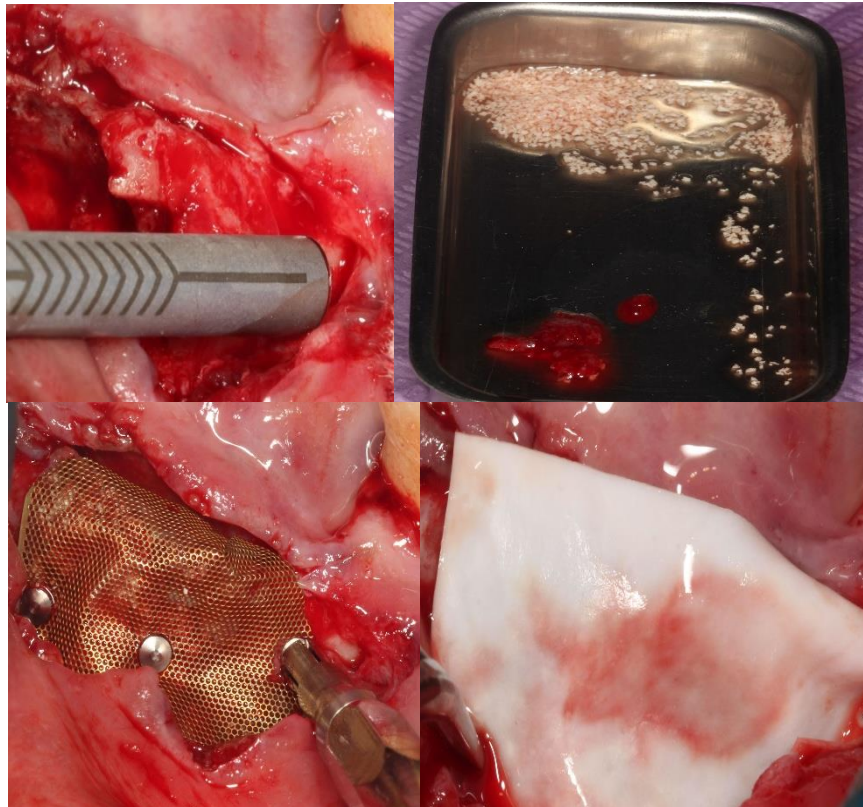
- Blue M gel was placed into the defect for 12 minutes for ensuring detoxification of the cystic area.





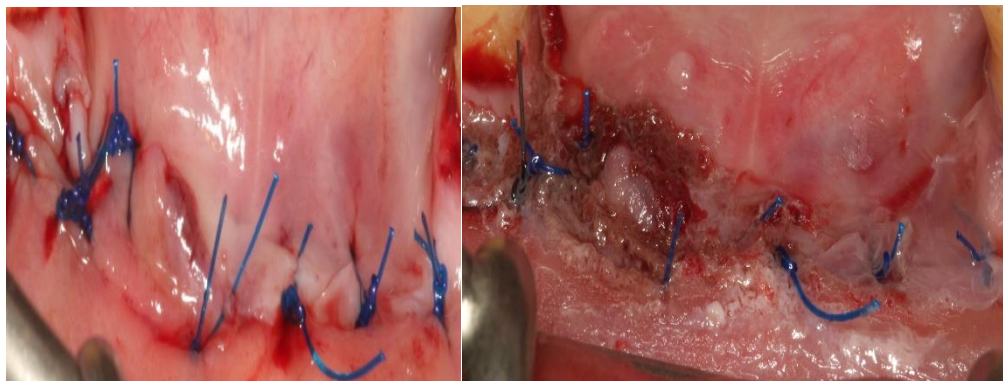
**Fig 5: using BLUE M gel for good healing.**

- **Grafting and Regeneration:** Autogenous bone was harvested using a micros bone scraper and mixed with particulate bone graft material. The combined graft was then placed into the osseous defect. To preserve the graft volume and support new bone formation, a titanium mesh was adapted over the site and secured with fixation tacks. A resorbable collagen membrane was placed over the mesh to prevent fibroblast migration into the grafted area and to facilitate predictable guided bone regeneration.(FIG6)

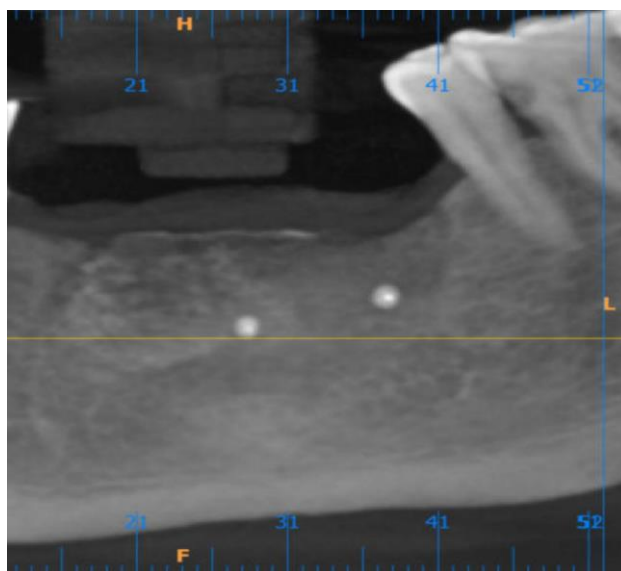


**Fig 6: grafting and regeneration .**

- **Flap Closure:** The flap was repositioned and sutured with **tension-free sutures**, and BLUE M gel promoting undisturbed healing.(FIG7)



**Fig 7: sutures with blue M GEL .**

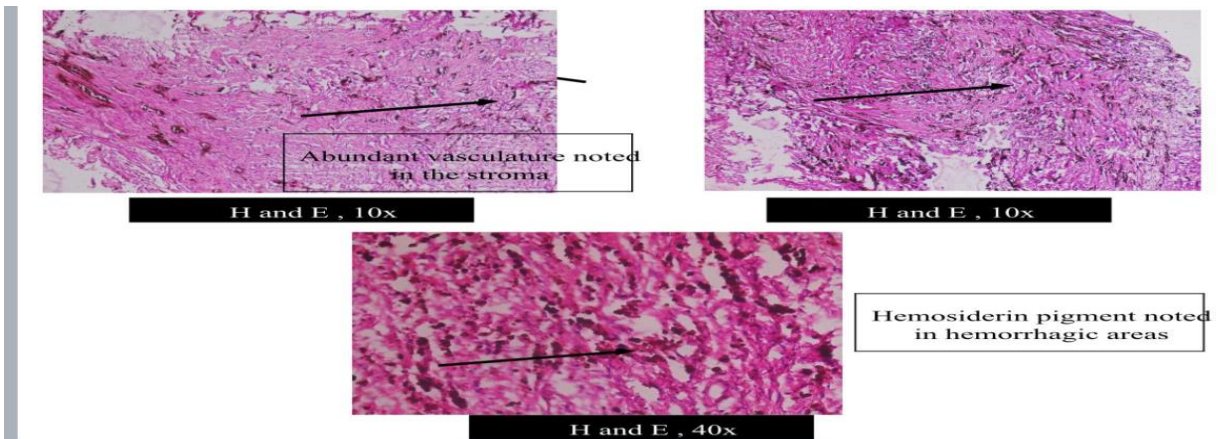


**Fig 8: POST OP CBCT after removal of cyst.**

### **HISTOPATHOLOGICAL FINDINGS**

Initial histopathological examination of the excised lesion revealed abundant hemosiderin deposits, multinucleated giant cells, and fibroblastic stroma—features suggestive of a brown tumor. Based on these findings, and considering the clinical presentation, a provisional diagnosis of brown tumor was made. However, further evaluation of the patient's endocrine profile, including thyroid function tests, revealed no abnormalities typically associated with hyperparathyroidism, which is commonly linked to brown tumor formation.

To refine the diagnosis, cone-beam computed tomography (CBCT) was performed, which demonstrated radiographic features more consistent with an inflammatory periapical lesion. Correlating these findings with the patient's dental history and the absence of systemic endocrine disorders, the final diagnosis was revised to radicular cyst.(FIG9)



**Fig 9: biopsy report .**

### **Implant Placement and Rehabilitation**

After approximately four months of healing, clinical and radiographic evaluation revealed satisfactory bone regeneration at the grafted site. Subsequently, four dental implants were placed in the anterior mandible using a guided surgical protocol. Following a successful osseointegration period, the implants were restored with a porcelain-fused-to-metal (PFM) fixed prosthesis, resulting in enhanced masticatory function and improved esthetics, contributing to the patient's overall confidence and satisfaction. In the maxillary arch, initial rehabilitation was carried out with a temporary fixed dental prosthesis, which was delivered for an interim period of eight weeks following implant placement. This allowed for soft tissue maturation and patient adaptation. After the provisional phase, a definitive PFM prosthesis was fabricated and delivered, completing the full-arch rehabilitation and restoring optimal oral function and esthetics.



**Fig 10 – final post op image.**

### **DISCUSSION**

This case highlights the importance of advanced imaging in implant planning, particularly in edentulous regions. The OPG failed to detect any abnormalities, but **CBCT identified a hidden cystic lesion**—altering the treatment plan significantly.

A **multilayered regenerative approach** using **bone graft, titanium mesh, and collagen membrane** ensured proper defect healing and allowed subsequent implant placement. The early suspicion of a brown tumor underscores the necessity of **histopathological confirmation** in such lesions. Ultimately, the patient benefited from a comprehensive and customized treatment that delivered both **esthetic and functional stability**.

### CONCLUSION

An integrated diagnostic and surgical approach, including the use of CBCT, ensured the successful detection and management of a large radicular cyst in an edentulous anterior mandible. With careful surgical intervention and regenerative techniques, the site was successfully rehabilitated using four dental implants, providing the patient with a **permanent, esthetic, and functional solution**.

### References

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