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`Bismuth Iodoform Paraffin Paste (BIPP) Packing as an Adjunct to Surgical Management of Large Odontogenic Cystic Lesions of the Jaws: A Case Series

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Abstract
Background: *Bismuth Iodoform Paraffin Paste (BIPP) is a compound surgical dressing originally introduced by Rutherford Morrison during World War I. Comprising bismuth subnitrate, iodoform, and liquid paraffin, it exerts antiseptic, hemostatic, and wound-healing properties. Despite its established role in ENT and general surgery, its systematic documentation as a cavity-packing adjunct following enucleation of large odontogenic jaw cysts remains sparse in the oral and maxillofacial literature.*
Methods: *We present a prospective case series of eight patients who underwent surgical management of large odontogenic cystic lesions at Department of Oral and Maxillofacial Surgery, Mahatma Gandhi Dental College and Hospital, Jaipur, between 2024-2025. All diagnoses were confirmed histopathologically. Following enucleation (with adjunctive chemical cauterization using modified Carnoy's solution where indicated), BIPP-impregnated ribbon gauze was used to pack the residual cystic cavities. Clinical and radiographic follow-up was performed at regular intervals.*
Results: *Patient ages ranged from 9 to 33 years. Diagnoses included odontogenic keratocyst (OKC), keratocystic odontogenic tumor (KOT), and dentigerous (follicular) cysts. All cases demonstrated uneventful post-operative healing with progressive bone formation confirmed radiographically. BIPP provided an aseptic wound environment conducive to secondary healing without significant local or systemic adverse events.*
Conclusion: *BIPP packing following surgical enucleation of large jaw cysts is a safe, cost-effective, and clinically reliable adjunct. It delivers antisepsis, haemostasis, and a scaffold environment for granulation tissue formation, thereby supporting conservative cyst management and reducing the need for aggressive resection.*
Keywords: *Bismuth iodoform paraffin paste; BIPP; odontogenic cyst; odontogenic keratocyst; keratocystic odontogenic tumor; dentigerous cyst; cyst enucleation; wound packing; jaw cyst*

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I. INTRODUCTION

Odontogenic cystic lesions of jaws represent a broad & clinically diverse group of pathologies that pose significant management challenges to oral and maxillofacial surgeons. These lesions, which include odontogenic keratocysts (OKC), keratocystic odontogenic tumours (KOT), and dentigerous (follicular) cysts, are characterised by variable growth potential, tendency toward cortical expansion, and, in the case of OKC/KOT, a well-documented propensity for local recurrence.

The World Health Organization (WHO) reclassified the OKC from the cystic to the neoplastic category in 2005 — renaming it keratocystic odontogenic tumour — on account of its aggressive biological behaviour and recurrence rates of up to 50%. The 2017 WHO Classification of Head and Neck Tumours reverted the nomenclature to OKC within the cystic category; however, its biological significance remains undisputed.

Treatment modalities range from conservative enucleation and curettage to marsupialization, decompression, and — in highly recurrent or large lesions — segmental resection. The quest for conservative management while minimising recurrence has led to the adoption of adjunctive techniques such as chemical cauterisation with Carnoy's solution, cryotherapy, and peripheral ostectomy. For large cystic cavities, primary closure is frequently unfeasible, necessitating open packing of the residual bony defect.

Bismuth Iodoform Paraffin Paste (BIPP), introduced by Rutherford Morrison in 1916 for dressing wartime wounds, is a compound of bismuth subnitrate, iodoform, and liquid paraffin. Traditionally the domain of ENT surgeons for nasal packing and post-tonsillectomy haemostasis, BIPP has increasingly found application in oral & maxillofacial surgery for surgical cavity packing following cyst enucleation, alveolar surgery, and management of dead space.

Despite its growing use, large prospective case series documenting role of BIPP specifically in oral and maxillofacial cystic lesions are limited. This case series aims to systematically document clinical application, surgical technique, and outcomes of BIPP packing in eight patients with histopathologically confirmed large jaw cysts managed at a tertiary dental institution in Jaipur, Rajasthan, India.

II. PHARMACOLOGY AND MECHANISM OF ACTION OF BIPP

BIPP is a bright yellow, non-sterile paste composed of three active and inert ingredients in specific proportions (Table 1). Bismuth subnitrate is an astringent that exerts topical antiseptic activity by releasing dilute nitric acid on hydrolysis, which stimulates an immune response and promotes tissue shrinkage. Bismuth has a half-life of approximately five days in soft tissue.

Iodoform (triiodomethane, CHI_3) decomposes to release iodine, which is a potent antiseptic and deodorising agent, providing sustained antibacterial activity within the wound cavity. Liquid paraffin serves as a lubricant, facilitating atraumatic placement and removal of the gauze pack while rendering the gauze impermeable to blood and body fluids — thereby reducing the nutritional substrate available for microbial proliferation.

When impregnated into ribbon gauze, BIPP further promotes wound healing by stimulating granulation tissue formation, providing a stable, bacteriostatic environment during the secondary healing phase, and maintaining cavity obliteration that prevents haematoma formation and dead space infection.

Table 1. Composition and pharmacological role of BIPP constituents

Component	Concentration	Role
Bismuth Subnitrate	250 mg/g	Antiseptic; releases dilute nitric acid on hydrolysis; astringent properties reducing exudate
Iodoform (Triiodomethane)	500 mg/g	Antiseptic; decomposes to release iodine; antibacterial; deodorizing effect
Liquid Paraffin	250 mg/g	Lubricant; facilitates atraumatic placement and removal; renders gauze impervious to body fluids; stimulates granulation tissue

III. METHODS

3.1 Setting and Patient Selection

This prospective case series was conducted at the Department of Oral and Maxillofacial Surgery, Mahatma Gandhi Dental College and Hospital (MGDCH), Jaipur, Rajasthan, India, between June 2024 and May 2025. All patients presenting with large odontogenic cystic lesions of jaws requiring surgical enucleation were considered for inclusion. Diagnosis was established via incisional biopsy with histopathological confirmation prior to definitive surgery. Patients with known hypersensitivity to iodine, bismuth, or any component of BIPP, or those with pre-existing thyroid dysfunction, were excluded.

3.2 Pre-operative Workup

All patients underwent thorough clinical examination, orthopantomography (OPG), and — where indicated by lesion extent — cone-beam computed tomography (CBCT) or multislice CT with three-dimensional reconstruction. Routine haematological investigations were obtained. Patients were counselled regarding the nature of the lesion, surgical risks, and the BIPP packing protocol, and written informed consent was obtained.

3.3 Surgical Protocol

Surgery was performed under general anaesthesia (nasotracheal intubation) or local anaesthesia with sedation depending on lesion size and patient age. A crestal or vestibular incision was placed with full-thickness mucoperiosteal flap reflection to expose the cystic cavity. Complete enucleation of cystic lining was performed meticulously. Where the lesion was an OKC or KOT, modified Carnoy's solution (absolute ethanol, glacial acetic acid, ferric chloride, without chloroform) was applied to the bony walls for a maximum of two minutes, followed by thorough saline irrigation.

Following haemostasis, cystic cavity was irrigated copiously with normal saline & povidone–iodine solution. Ribbon gauze impregnated with BIPP paste was then packed firmly but atraumatically into the residual bony defect, with one end of the gauze exteriorised at the distal aspect of the incision to facilitate regular dressing changes. Wound closure was achieved with Vicryl 2-0 or 3-0 sutures, leaving the BIPP tail accessible.

3.4 Post-operative Management and Follow-up

All patients were prescribed a standard regimen of amoxicillin-clavulanate 625 mg 12-hourly, metronidazole 400 mg 8-hourly, and diclofenac-paracetamol for seven days. Patients were reviewed in the outpatient department every one to two weeks for BIPP dressing changes until clinical and radiographic evidence of satisfactory cavity healing and progressive bone formation was established. OPGs were obtained at one month, three months, six months, and thereafter at six-monthly intervals.

IV. CASE PRESENTATIONS

Case 1: Odontogenic Keratocyst of the Right Mandible (Adult Male, 33 Years)

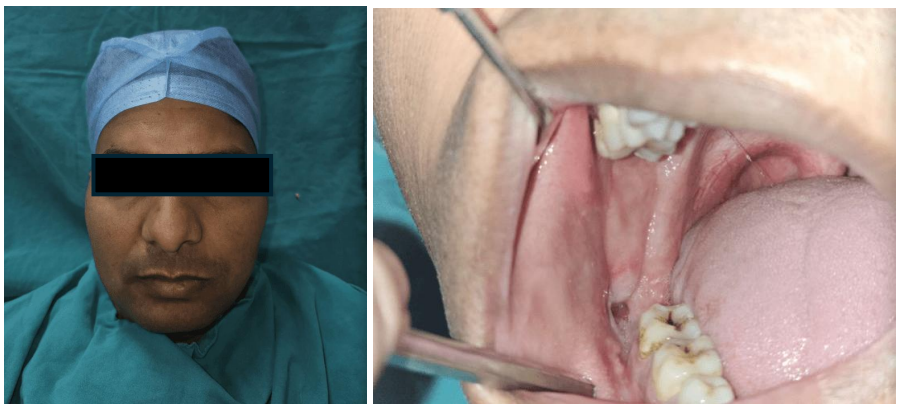
A 33-year-old male presented to Department of Oral and Maxillofacial Surgery, MGDCH Jaipur, with a chief complaint of dull, intermittent pain in right lower posterior teeth region of 10–12 days duration. Pain was aggravated by chewing and was non-radiating. The history was notable for extraction of tooth 48 under local anaesthesia two years prior and tooth 18 one month prior.

Clinical examination revealed no significant facial asymmetry. Intraoral examination demonstrated intact mucosa overlying the right posterior mandible. Orthopantomography (OPG) revealed a well-defined radiolucent lesion in right mandible extending from molar region posteriorly. Haematological investigations were within normal limits.

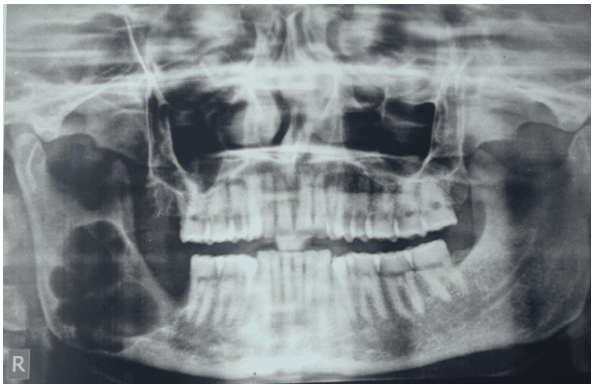
Under general anaesthesia, crestal incision was placed over right posterior mandibular ridge. A full-thickness mucoperiosteal flap was raised and lesion site was exposed. Cystic lining was carefully curretted and removed in toto and submitted for histopathological examination (HPE). Haemostasis was achieved and chemical cauterisation was performed with Carnoy's solution for two minutes, followed by thorough saline irrigation. C avity was then packed with BIPP-impregnated ribbon gauze, leaving one end of the gauze at the level of tooth #46. Wound closure was achieved with Vicryl 2-0 sutures.

Histopathological examination (Central Laboratory, Mahatma Gandhi Hospital) reported: 'Section shows squamous epithelium-lined fibrous tissue. No dysplasia/malignancy seen.' Impression: Benign fibroepithelial lesion, negative for malignancy.

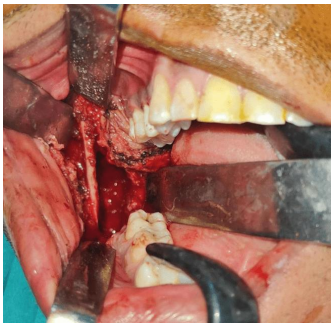
Post-operative recovery was uneventful. BIPP dressing was changed every one to two weeks on an outpatient basis. Serial OPGs at one month (June 2024), four months (October 2024), and six months (December 2024) demonstrated progressive bone fill of the cystic cavity. The patient remained asymptomatic and compliant at all follow-up appointments.



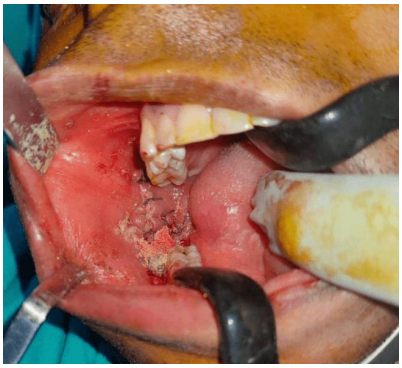
Case 1 — Pre-operative profile and frontal views of the patient.



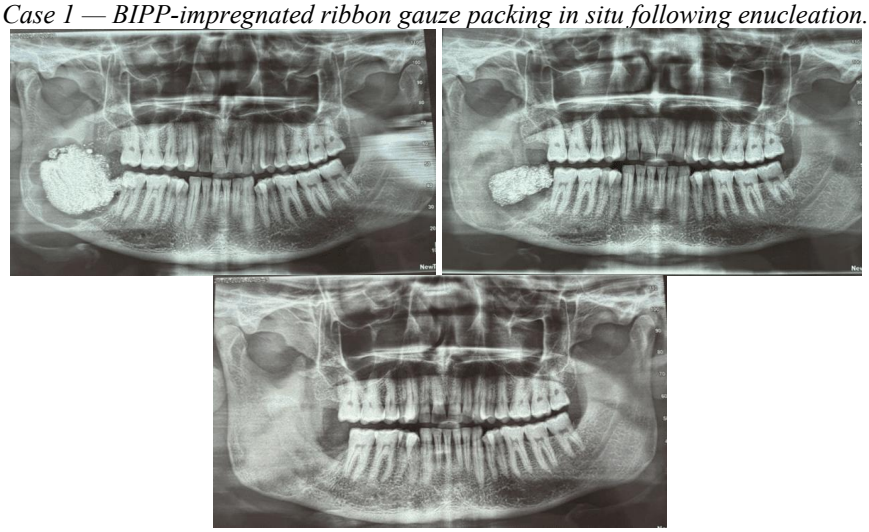
Case 1 — Pre-operative OPG (June 2024) demonstrating a well-defined radiolucent lesion in the right mandible.



Case 1 — Intraoperative views showing cystic lining exposure, curettage, and application of Carnoy's solution.



Case 1 — BIPP-impregnated ribbon gauze packing in situ following enucleation.



Case 1 — Serial OPGs at one month (October 2024) and six months (December 2024) showing progressive bone formation.

Case 2: Keratocystic Odontogenic Tumour (KOT) of the Right Mandible (Young Male, 20 Years)

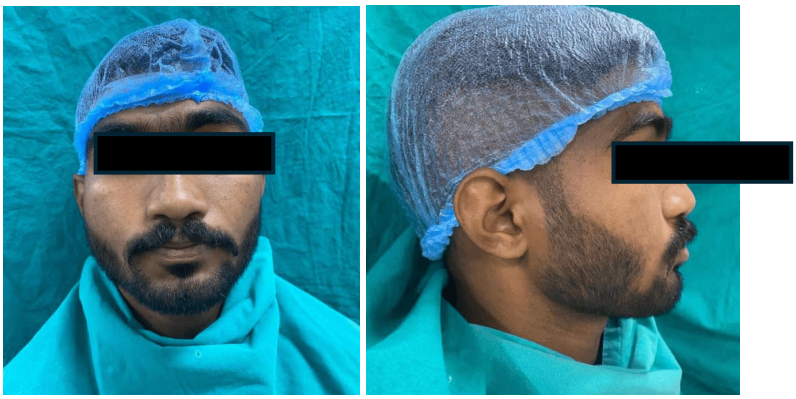
A 20-year-old male presented with chief complaint of progressive swelling in lower right posterior teeth region for one year, associated with pain on chewing, relieved partially by medication.

Extraoral examination revealed mild facial swelling on right side with no overlying skin changes. Intraoral examination showed obliteration of buccal vestibule in right posterior mandible with missing posterior teeth. OPG (Dept. of Oral and Maxillofacial Radiology, MGDCH, dated 26 December 2024) revealed a large well-defined radiolucent lesion extending from right mandibular premolar region to ramus, with cortical expansion. CT imaging was performed to delineate lesion extent and relationship to the inferior alveolar nerve.

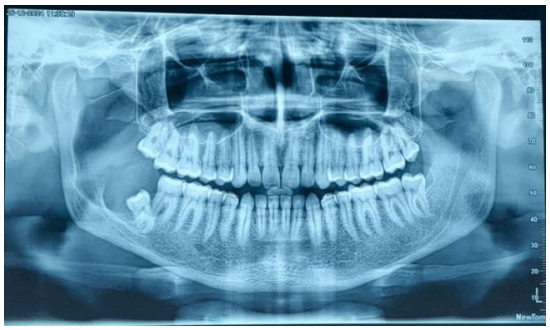
Incisional biopsy was performed at MGDCH. Histopathological examination revealed: H&E-stained tissue sections showing approximately six cell layers of epithelium with palisaded basal nuclei, hyperchromatic nuclei, a refractile keratinised surface layer, daughter cysts or buds off the epithelium, and Rushton bodies with abnormal keratin aggregations. Diagnosis: findings suggestive of Keratocystic Odontogenic Tumour (KOT).

Under general anaesthesia with nasotracheal intubation, a right-sided submandibular utility incision was placed. Layer-by-layer dissection was carried out; marginal mandibular nerve was identified and preserved. The facial artery & accompanying vessels were identified & ligated. A full-thickness mucoperiosteal flap was raised intraorally. IMF screws (2 × 3 mm) were placed in the right maxillary and mandibular arches for stabilisation. Teeth #47 and #48 were extracted; the pathological lining from the #48 region was removed, sent for definitive HPE, and cavity was irrigated with betadine and normal saline. Intraoral closure was achieved with Vicryl 2-0; extraoral closure was performed in layers with Vicryl 2-0 and skin staplers. A pressure dressing was applied.

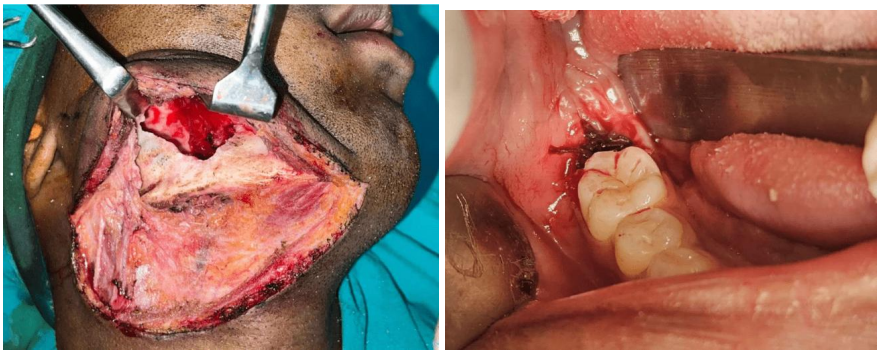
BIPP-impregnated ribbon gauze was placed into the residual intraoral cystic cavity following complete enucleation. Dressings were changed at fortnightly intervals as an outpatient. Serial OPGs from July 2025, November 2025, January 2026, March 2026 showed progressive bone infill of the previously large cystic cavity, with the characteristic BIPP radiopacity gradually decreasing as packing was incrementally reduced. The extraoral wound healed with a fine, maturing submandibular scar. No recurrence was detected at the most recent follow-up.

[

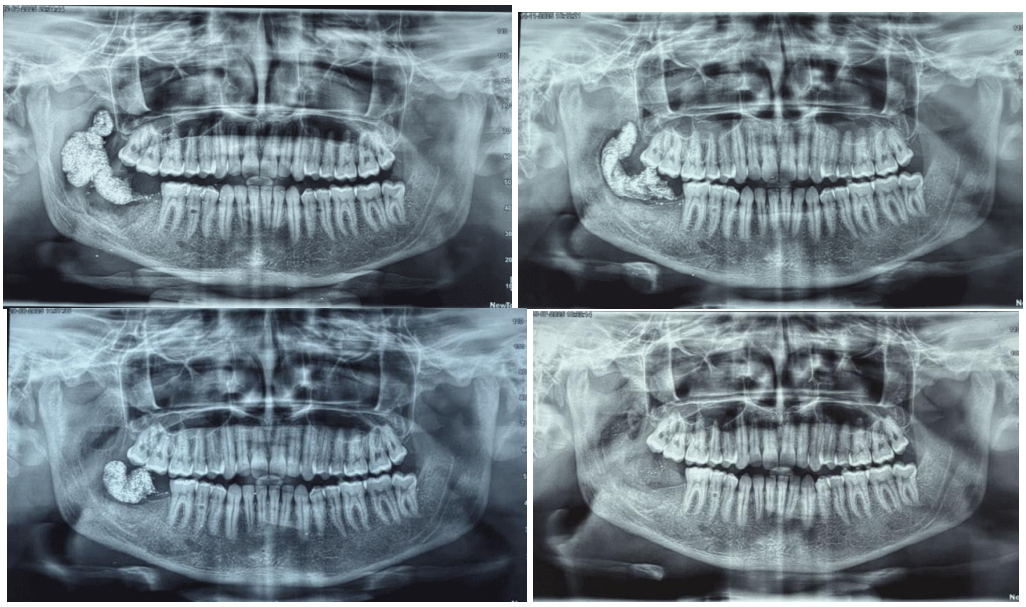
Case 2 — Pre-operative frontal and profile views demonstrating right mandibular swelling.



Case 2 — Pre-operative OPG (December 2024) showing a large radiolucent lesion extending to the ramus.



Case 2 — Intraoperative extraoral approach; submandibular incision and surgical exposure of the lesion. And Intraoral view following enucleation with BIPP ribbon gauze packing in situ.



Case 2 — Serial OPGs (July 2025, November 2025, January 2026, March 2026) demonstrating progressive bone regeneration and gradual removal of BIPP pack.

Case 3: Large Dentigerous Cyst of the Left Maxilla (Paediatric Male, 9 Years)

A 9-year-old male child was brought to Department of Oral and Maxillofacial Surgery, MGDCH Jaipur, with chief complaint of painless progressive swelling of left cheek for several months. The child was generally healthy with no significant systemic history.

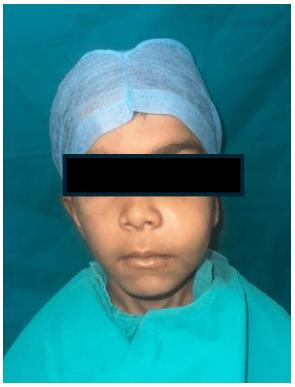
Extraoral examination revealed diffuse bony-hard swelling on left side of face with significant facial asymmetry. Intraoral examination demonstrated vestibular obliteration on the left maxillary side, with displaced primary and permanent dentition. CBCT imaging (3D Solution, Alwar) revealed well-defined unilocular radiolucent lesion in the left maxilla with buccal cortical expansion and involvement of the developing dental follicles. Three-dimensional reconstruction and multiplanar views confirmed the extent and displacement of tooth buds.

Fine needle aspiration cytology (FNAC; Central Laboratory, Mahatma Gandhi Hospital) reported: 'USG-guided FNAC, left maxillary region — Acute inflammatory exudate; no granulomas/atypical cells seen.' Impression: acute inflammatory exudate, suggestive of infected cystic lesion.

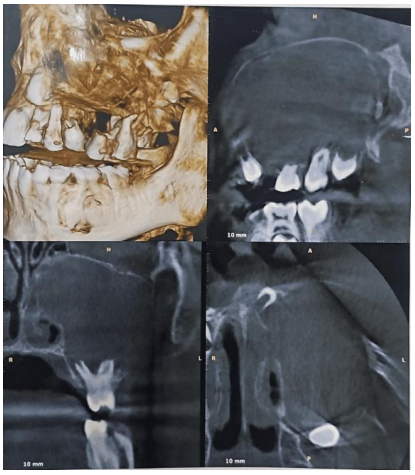
Surgical management was undertaken under general anaesthesia (nasotracheal intubation). An intraoral approach was adopted with a vestibular incision extending from the molar region anteriorly; full-thickness mucoperiosteal flap was raised to expose the lesion. Complete enucleation of the cystic lining was performed along with removal of the involved third molar tooth bud and displaced second molar. The cavity was thoroughly irrigated with normal saline & povidone–iodine. BIPP-impregnated ribbon gauze was packed into the large residual bony defect, with the gauze tail exteriorised. Wound closure was achieved with Vicryl 3-0.

Histopathological examination of the cystic wall (Mahatma Gandhi Hospital) reported: 'Section for cyst wall shows fibro-adipose and fibro-connective tissue with mild chronic inflammation. No epithelial lining seen. No granulomas/malignancy seen.' Impression: Benign cyst, negative for malignancy.

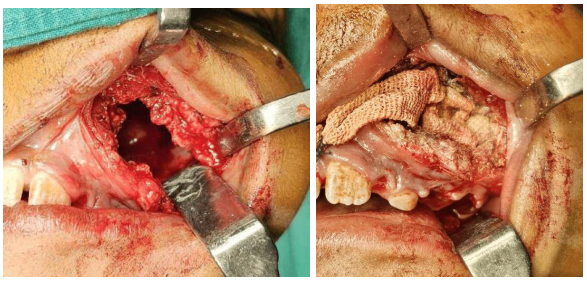
BIPP dressing changes were performed every one to two weeks. Post-operative follow-up OPGs (April 2025, May 2025 — multiple serial radiographs) demonstrated the characteristic radiopaque BIPP material within the cavity with gradual progressive bone infill confirmed radiographically at each visit. The child tolerated all dressing changes well. Facial symmetry improved progressively with no evidence of residual or recurrent cystic change at most recent follow-up.



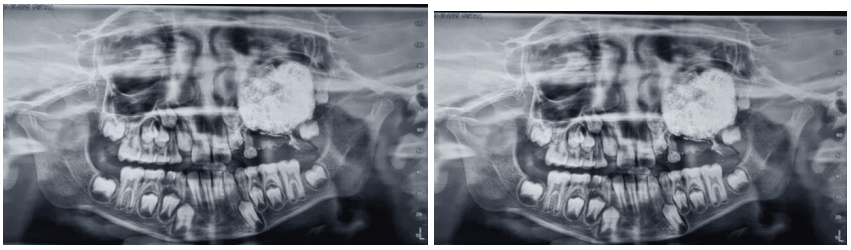
Case 3 — Pre-operative frontal and profile views of the 9-year-old patient with left maxillary swelling.

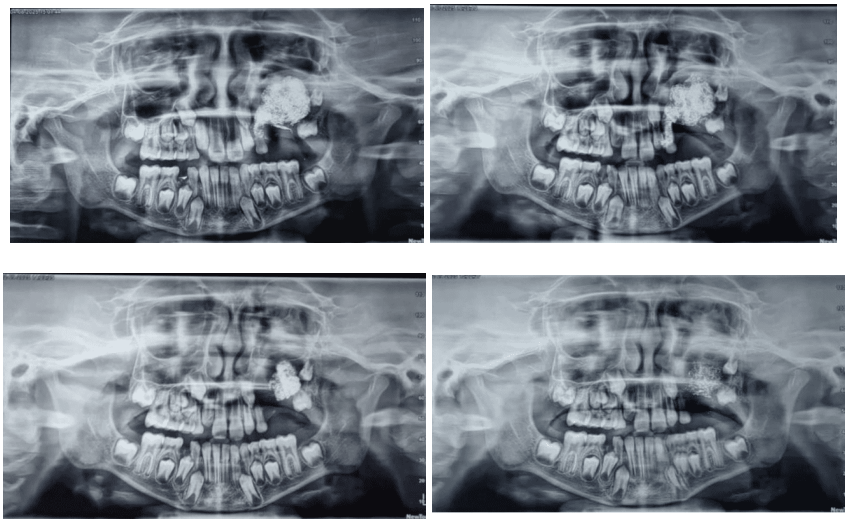


Case 3 — Pre-operative CBCT (3D Solution, Alwar) with 3D reconstruction and multiplanar sections showing the extent of the left maxillary dentigerous cyst.



Case 3 — Intraoperative views showing enucleation of the cystic lesion and tooth bud removal.





Case 3 — Serial OPGs (April 2025 to May 2025) demonstrating BIPP in situ with progressive bone formation over successive follow-up visits.

Case 4: Odontogenic Keratocyst of the Right Mandible (Adult Female, 37 Years)

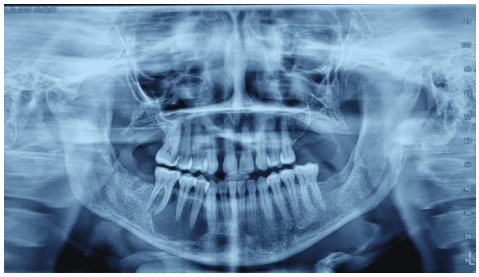
A 37-year-old female, presented to Department of Oral and Maxillofacial Surgery, MGDCH Jaipur, with a chief complaint of pain and swelling in the right lower jaw region of 15 days duration. The pain was mild, intermittent, and localized in nature, associated with lower lip numbness. The swelling had gradually increased in size. The patient gave a history of taking antibiotics and analgesics 15 days prior to presentation.

Extraoral examination revealed mild facial asymmetry secondary to the right mandibular swelling. Serial orthopantomographs (OPGs) were obtained at initial presentation and at follow-up intervals (February 2025, March 2025, April 2025, May 2025, June 2025), documenting progressive changes in the lesion. An incisional biopsy was performed at the Department of Oral and Maxillofacial Pathology, MGDCH. Histopathological examination of tissue from the right anterior vestibule of the mandible revealed: H&E-stained sections showing epithelial lining 6–8 cells thick lacking rete ridges, a palisaded hyperchromatic basal cell layer composed of columnar cells, and lumen containing keratinaceous debris. Diagnosis: findings suggestive of Odontogenic Keratocyst (OKC).

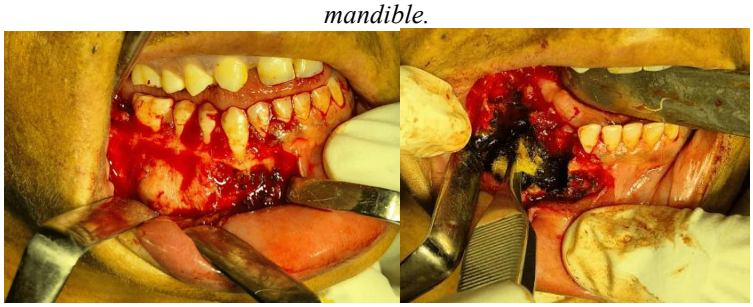
Under general anaesthesia with nasotracheal intubation (OT No. 6), the patient was painted and draped. An intraoral right crevicular incision was placed in relation to teeth #43, #44, #45, and #46. Extraction of teeth #43, #44, #45, and #46 was performed. Complete excision of the lesion along with its lining was carried out and submitted for histopathological examination. Modified Carnoy's solution was applied to the cystic cavity for two minutes, followed by thorough saline irrigation. BIPP-impregnated ribbon gauze was then packed into the residual bony defect. Intraoral wound closure was achieved with 2-0 Vicryl sutures. The patient was extubated uneventfully and shifted to the recovery ward.

Post-operative recovery was uneventful. Serial OPGs obtained over the follow-up period (March–June 2025) demonstrated progressive reduction of the cystic cavity with ongoing bone formation. BIPP dressing changes were performed at fortnightly intervals on an outpatient basis. No recurrence was detected at the most recent follow-up. Clinical photographs (frontal and profile views) and serial OPGs documenting the pre-operative lesion, intraoperative findings, and post-operative bone healing are presented in the accompanying figures.

Case 4 — Pre-operative profile and frontal views of the patient.

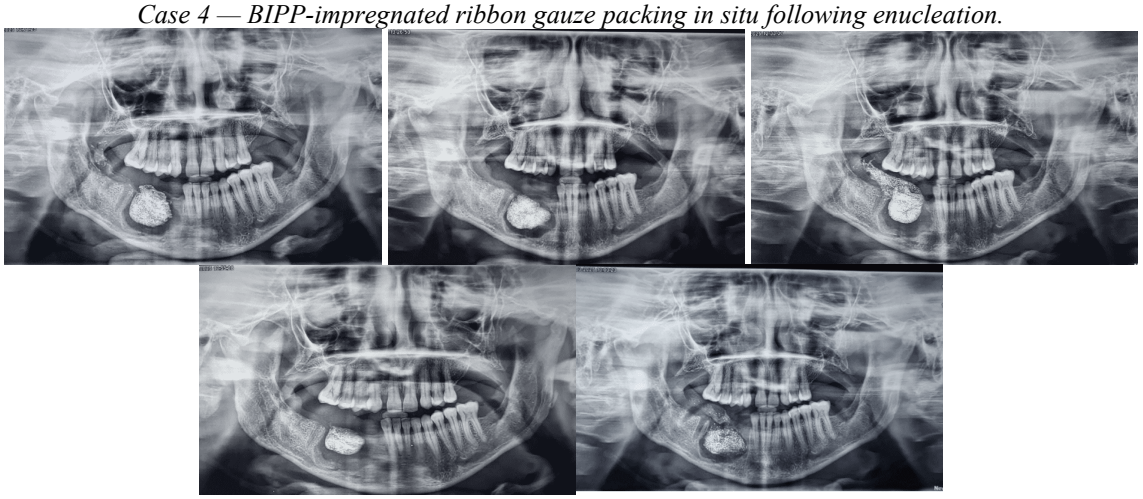


Case 4 — Pre-operative OPG (June 2024) demonstrating a well-defined radiolucent lesion in the right mandible.



Case 4 — Intraoperative views showing cystic lining exposure, curettage, and application of Carnoy's solution.

Case 4 — BIPP-impregnated ribbon gauze packing in situ following enucleation.



Case 4 — Serial OPGs at one month (October 2024) and six months (December 2024) showing progressive bone formation.

Case 5: Dentigerous Cyst of the Right Mandible (Adult Male, 49 Years)

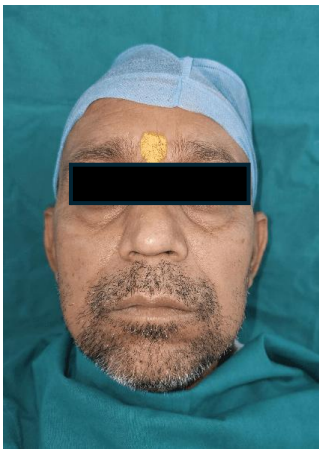
A 49-year-old male, presented to the Department of Oral and Maxillofacial Surgery, MGDCH Jaipur, with a chief complaint of swelling in the lower right back jaw region for 9 days. The patient gave a history of pain in the same region 1.5 years prior, for which he had consulted a doctor in Kota and was prescribed medications. He also reported an episode of swelling 15 days prior to presentation, during which he applied clove to the affected area and experienced fluid discharge into the oral cavity. He had subsequently consulted another physician at a referral hospital (RHL) where fine needle aspiration cytology (FNAC), contrast-enhanced CT (CECT) face, routine blood investigations, and 2D echocardiography were performed.

Histopathological examination (Department of Oral and Maxillofacial Pathology, Mahatma Gandhi Dental College and Hospital of the formalin-fixed specimen — comprising multiple greyish, irregular, firm pieces measuring approximately 1 × 1 × 1 cm — revealed: H&E-stained sections showing non-keratinized odontogenic

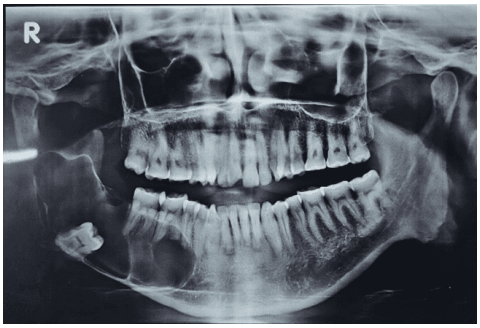
epithelium lining resembling reduced enamel epithelium, with connective tissue stroma exhibiting collagen fibre bundles, mild inflammatory cell infiltrate (predominantly lymphocytes), odontogenic islands, live bone fragments, and dilated, engorged blood vessels with extravasated red blood cells. Diagnosis: Dentigerous Cyst. (Clinical correlation radiographically advised.)

Under general anaesthesia with left nasotracheal intubation, a throat pack was placed and the patient was painted and draped. Extractions of teeth #45, #46, and #47 were performed. An intraoral incision was placed in relation to the right retromolar trigone region. The cystic lesion was exposed and complete cystic enucleation was carried out along with extraction of tooth #48; the specimen was submitted for histopathological examination. BIPP-impregnated ribbon gauze was placed in situ and secured with 2-0 Vicryl, with a portion of the ribbon gauze (BIPP tail) left exposed for subsequent dressing changes. Wound closure was achieved with 2-0 Vicryl. The throat pack was removed, and the patient was extubated and shifted to the ward.

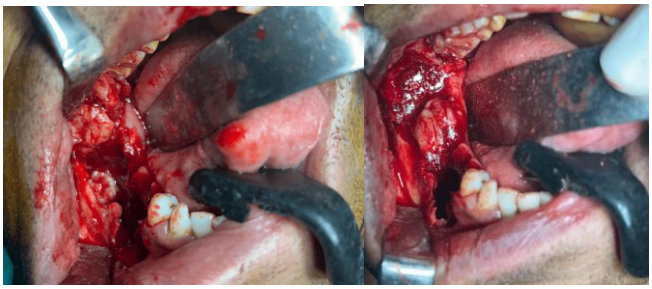
Post-operative recovery was uneventful. BIPP dressing changes were performed at regular outpatient intervals. Serial follow-up is ongoing with clinical and radiographic monitoring. No evidence of recurrence was noted at the most recent review.



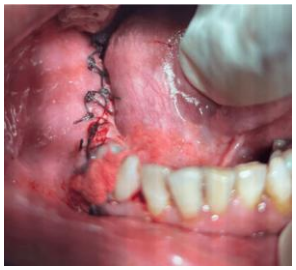
Case 5 — Pre-operative profile and frontal views of the patient.



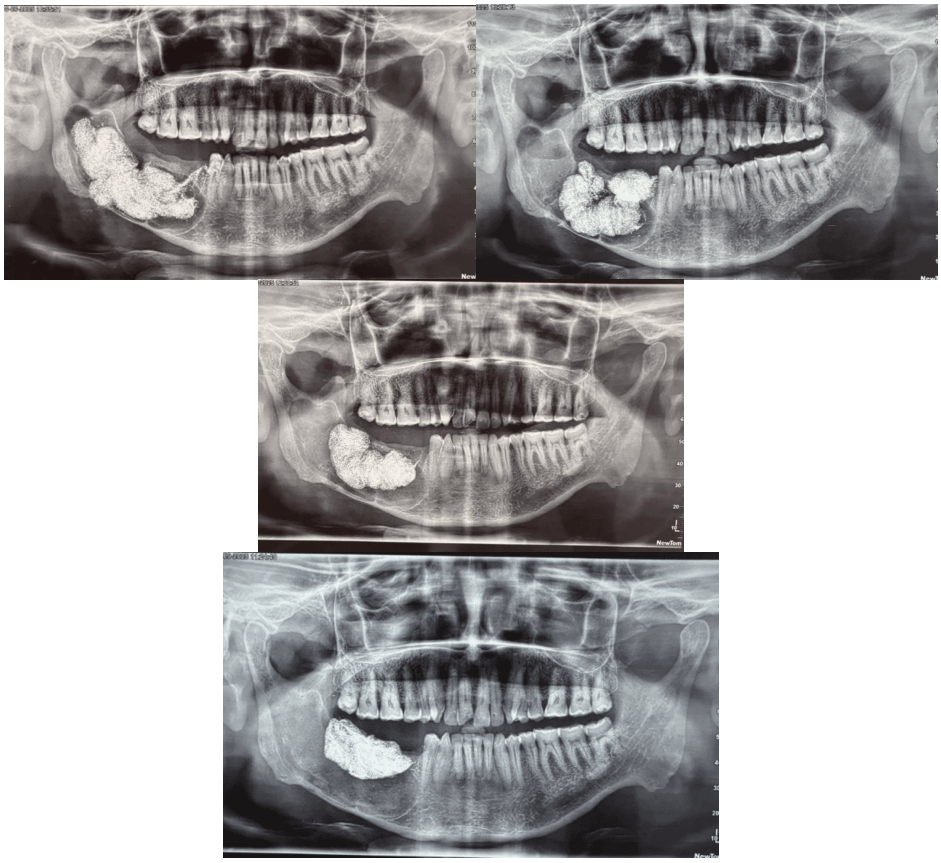
Case 5 — Pre-operative OPG (June 2024) demonstrating a well-defined radiolucent lesion in the right mandible.



Case 5 — Intraoperative views showing cystic lining exposure, curettage, and application of Carnoy's solution.



Case 5 — BIPP-impregnated ribbon gauze packing in situ following enucleation.



Case 5 — Serial OPGs at one month (October 2024) and six months (December 2024) showing progressive bone formation.

Case 6: Radicular Cyst of the Right Mandible (Paediatric Female, 10 Years)

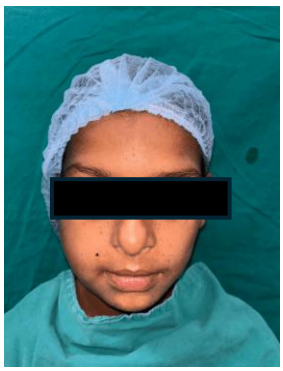
A 10-year-old female child, was brought to the Department of Oral and Maxillofacial Surgery, MGDCH Jaipur, with a chief complaint of pain and swelling in the lower right back tooth region of 8 days duration. The swelling was associated with pain and had gradually increased in size.

Histopathological examination (Department of Pathology, Mahatma Gandhi Medical College and Hospital; of the cystic lining from the right mandible — consisting of multiple grey-white to grey-brown soft tissue pieces measuring 2 × 1.5 × 0.9 cm — revealed the impression of a Radicular Cyst. The specimen was negative for malignancy and dysplasia.

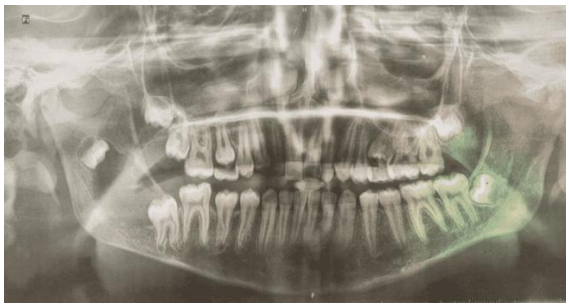
Under general anaesthesia with left nasal fibreoptic intubation, the patient was painted and draped. A right lower buccal vestibule incision was placed. The cystic lesion was exposed and a pathological fracture was identified in the right ramus of the mandible. Curettage was performed and modified Carnoy's solution was applied to the cystic cavity, followed by thorough saline irrigation. BIPP-impregnated ribbon gauze was packed into the residual cavity. Bilateral intermaxillary fixation (IMF) screws were placed in the maxilla and mandible. Haemostasis was achieved and wound closure was performed with 2-0 Vicryl sutures. The patient was extubated uneventfully and shifted to the recovery ward.

Post-operative recovery was uneventful. BIPP dressing changes are scheduled at fortnightly outpatient intervals. Follow-up OPG at 7 days is arranged at the Department of OMFS, MGDCH. IMF screws provide

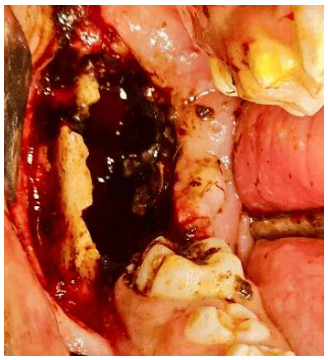
additional bony stabilization during the healing phase given the intraoperative finding of a pathological fracture. Clinical and radiographic follow-up is ongoing.



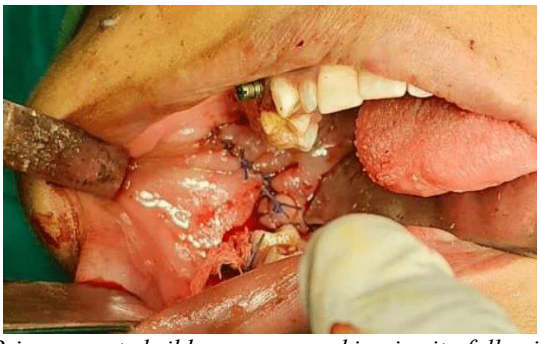
Case 6 — Pre-operative profile and frontal views of the patient.



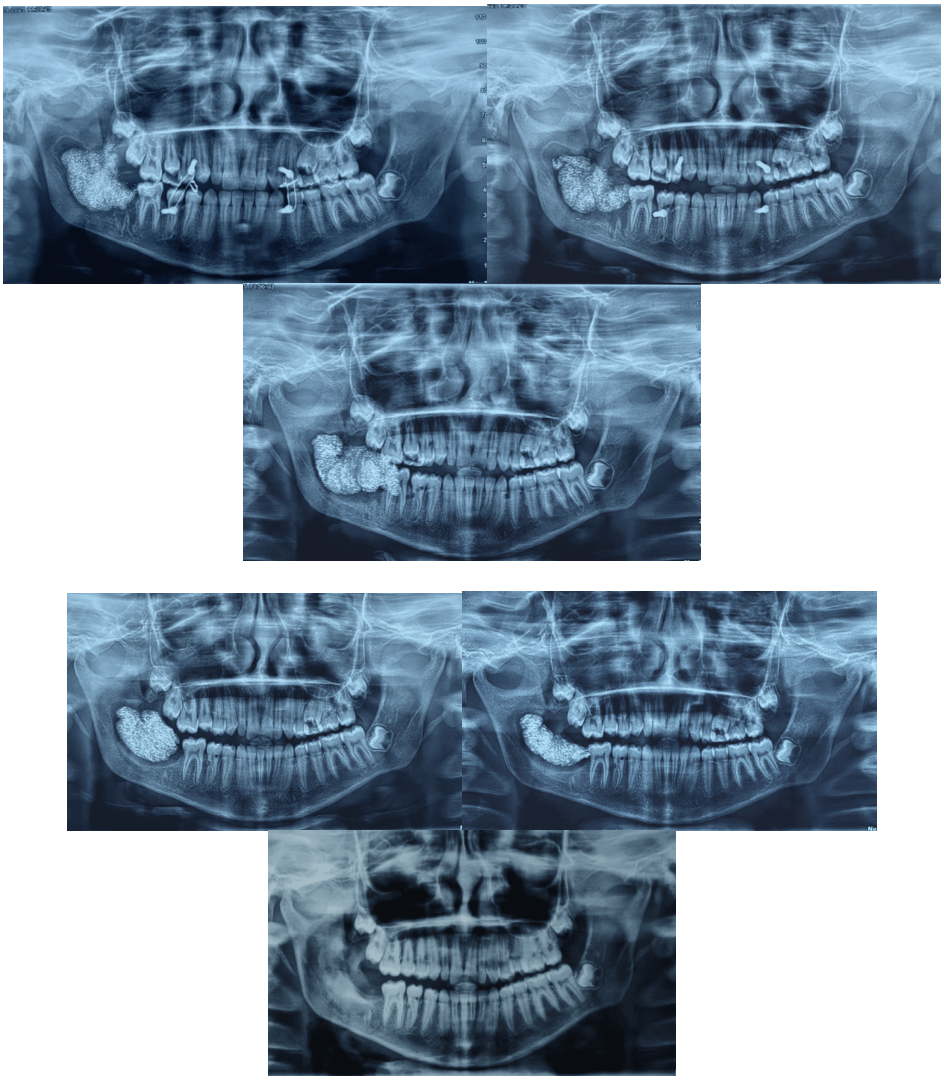
Case 6 — Pre-operative OPG (June 2024) demonstrating a well-defined radiolucent lesion in the right mandible.



Case 6 — Intraoperative views showing cystic lining exposure, curettage, and application of Carnoy's solution.



Case 6 — BIPP-impregnated ribbon gauze packing in situ following enucleation.



Case 6 — Serial OPGs at one month (October 2024) and six months (December 2024) showing progressive bone formation.

V. SUMMARY OF ALL CASES

Table 2. Summary of eight patients treated with BIPP packing following enucleation of large odontogenic jaw cysts

Case No.	Age / Sex	Diagnosis	Site	Chief Complaint	Surgical Management	Histopathology	BIPP Outcome
1	33 Y / M	Odontogenic Keratocyst	Right posterior mandible	Pain & swelling in right lower back teeth for 10–12 days	Crestral incision, full-thickness mucoperiosteal flap, cyst enucleation, Carnoy's solution cauterization, BIPP packing	Benign fibroepithelial lesion; negative for malignancy	Uneventful healing; progressive bone fill on serial OPGs
2	20 Y / M	Keratocystic Odontogenic Tumor (KOT)	Right mandible body and ramus	Swelling in lower right back teeth region for 1 year, pain on chewing	Submandibular utility incision, layer-by-layer dissection, marginal mandibular nerve preservation, lesion enucleation, BIPP packing	Keratocystic odontogenic tumor (palisaded basal cells, daughter cysts, Rushton bodies)	Good healing; scar maturing well; radiographic bone regeneration on follow-up
3	9 Y /	Large	Left	Painless facial	Intraoral and	Benign cyst; fibro-	Satisfactory healing;

Case No.	Age / Sex	Diagnosis	Site	Chief Complaint	Surgical Management	Histopathology	BIPP Outcome
	M	Dentigerous Cyst (Left Maxilla)	maxillary region	swelling left cheek, displaced dentition	extraoral approach, enucleation of cystic lesion, tooth bud removal, saline + betadine irrigation, BIPP ribbon gauze packing	adipose tissue with mild chronic inflammation; negative for malignancy	accelerated bone formation; follow-up OPGs confirm progressive infill
4	49 Y / M	Odontogenic Keratocyst (OKC)	Right posterior mandible	Pain and swelling in right lower jaw; lower lip numbness; 15 days	Intraoral right crevicular incision; extraction of teeth #43–46; cyst enucleation; Carnoy's solution; BIPP ribbon gauze packing; 2-0 Vicryl closure	Odontogenic Keratocyst: thin epithelial lining (6–8 cells), palisaded hyperchromatic basal cells, keratinaceous debris in lumen	Uneventful healing; progressive bone fill on serial OPGs (Feb–Jun 2025)
5	10 Y / F	Dentigerous Cyst	Right posterior mandible	Swelling in lower right jaw 9 days; prior pain 1.5 years; fluid discharge on applying clove	Intraoral incision RMT region; extraction of #45, #46, #47, #48; cystic enucleation; BIPP ribbon gauze packing; 2-0 Vicryl closure	Dentigerous Cyst: non-keratinized odontogenic epithelium, reduced enamel epithelium pattern, collagen stroma with lymphocytic infiltrate	Uneventful post-operative recovery; fortnightly dressing changes; follow-up ongoing; no recurrence
6	[Age] / [Sex]	Radicular Cyst	Right ramus of mandible	Pain and swelling in lower right back tooth region; 8 days; gradually increasing	Right lower buccal vestibule incision; cyst enucleation; pathological fracture managed; Carnoy's solution; BIPP packing; bilateral IMF screws; 2-0 Vicryl closure	Radicular Cyst; negative for malignancy/dysplasia (Path No. 092342-25)	Uneventful recovery; IMF screws for fracture stabilization; 7-day OPD follow-up; BIPP dressing changes ongoing

VI. DISCUSSION

The surgical management of large odontogenic jaw cysts poses a clinical dilemma: complete enucleation maximises specimen retrieval for accurate histopathological diagnosis and minimises recurrence, yet it invariably leaves a large, contaminated bony defect that cannot be closed primarily. The choice of cavity management — open packing, primary closure over a drain, or marsupialization — significantly influences the quality and speed of healing, the risk of infection, and patient comfort.

BIPP has been used clinically for over a century and its utility in ENT and general surgery is well established. Randhawa et al. comprehensively reviewed its history, constituents, uses, and alternatives in oral and maxillofacial surgery, concluding that BIPP remains a relatively safe, inexpensive, and clinically effective choice for surgical cavity packing despite the availability of newer alternatives.

In the oral and maxillofacial context, Agrawal et al. first documented the use of BIPP specifically in OKC management, reporting its efficacy as a cavity packing agent following peripheral ostectomy and Carnoy's solution application in a mandibular OKC. Choudhary et al. reported two cases in the maxillofacial region where BIPP was used to manage dead space and arrest uncontrolled haemorrhage from branches of the internal maxillary artery, demonstrating satisfactory healing at one month.

Morawala et al. documented the use of bismuth subnitrate iodoform paraffin paste in two paediatric patients with inflammatory dentigerous cysts, reporting rapid uneventful healing with dressing changes every ten days, and confirmed accelerated bone formation at six-month follow-up. Gaur et al. similarly reported complete bone formation within five months in a 9-year-old with a large mandibular dentigerous cyst following enucleation and BIPP open packing.

The present case series extends this evidence to a broader range of lesion types and age groups, documenting BIPP use across OKC, KOT, and dentigerous cysts — including paediatric (9 years) and adult patients (up to 33 years). All six documented cases demonstrated uneventful healing, progressive radiographic bone formation, and freedom from recurrence at their latest follow-up. Dressing changes were tolerated well, and no systemic adverse effects attributable to BIPP were recorded.

The biological rationale for BIPP use in this setting is multifactorial. The bismuth component exerts topical antiseptic and astringent activity, reducing wound exudate and bacterial colonisation. Iodoform provides sustained release of iodine, a broad-spectrum antiseptic that deodorises the cavity and inhibits microbial proliferation. Paraffin lubricates the gauze, facilitating painless weekly dressing changes and stimulating granulation tissue through its inert scaffold effect.

A critical advantage of BIPP over primary closure in large cavities is the elimination of dead space — a major risk factor for haematoma, seroma, and infection. Open packing with BIPP maintains ongoing drainage while providing a bacteriostatic, granulation-promoting microenvironment. The gauze also serves as an intraoperative reference for cavity size reduction at each dressing change.

The potential toxicity of BIPP components warrants discussion. Systemic bismuth absorption following mucosal contact can, rarely, cause encephalopathy; iodoform can provoke iodine-mediated hypersensitivity or iodism with prolonged use; and liquid paraffin may cause granulomatous reactions if absorbed through wounds. However, as documented in this series and in the broader literature, short-to-medium-term use of BIPP in enclosed surgical cavities with regular dressing changes is associated with a favourable safety profile. Its use should nonetheless be avoided in patients with known hypersensitivity, pre-existing thyroid disease, or significant renal impairment.

The combination of BIPP packing with Carnoy's solution in OKC/KOT cases represents a rational, conservative strategy: Carnoy's solution destroys residual epithelial rests at the bone margins to reduce recurrence, while BIPP provides the subsequent wound environment necessary for bone regeneration. Roy et al. documented a recurrence rate of 12.5% (1/8 cases) in a comparable case series of OKC managed with enucleation and Carnoy's solution — the single recurrence occurring without additional BIPP packing — suggesting that the adjunctive role of BIPP may contribute to the elimination of residual epithelial fragments through its ongoing antiseptic action.

VII. CONCLUSION

This case series demonstrates that BIPP-impregnated ribbon gauze packing is a safe, effective, and economical adjunct to the surgical management of large odontogenic cystic lesions of the jaws. It provides reliable antisepsis, haemostasis, and promotes secondary healing by granulation tissue formation in the residual bony defect. When used in conjunction with enucleation and — where indicated — chemical cauterisation with Carnoy's solution, BIPP facilitates conservative, tissue-sparing cyst management with favourable clinical and radiographic outcomes, thereby reducing the need for aggressive resection and complex reconstructive procedures.

Regular scheduled dressing changes, patient compliance, and appropriate patient selection (excluding those with iodine hypersensitivity or significant thyroid disease) are essential for optimal outcomes. Larger multicentre prospective studies with extended follow-up are warranted to validate these findings, compare BIPP with alternative cavity packing materials, and establish evidence-based protocols for its use in oral and maxillofacial surgery.

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