

# **Surgical Management of cysts**

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# Special investigations

## Radiography

This is an essential investigation for establishing the outline and extent of the lesion. It also shows the relationship of teeth and associated anatomical structures such as the inferior dental nerve. Cone beam CT can provide a more detailed picture to aid diagnosis or associated structures in relevant cases.

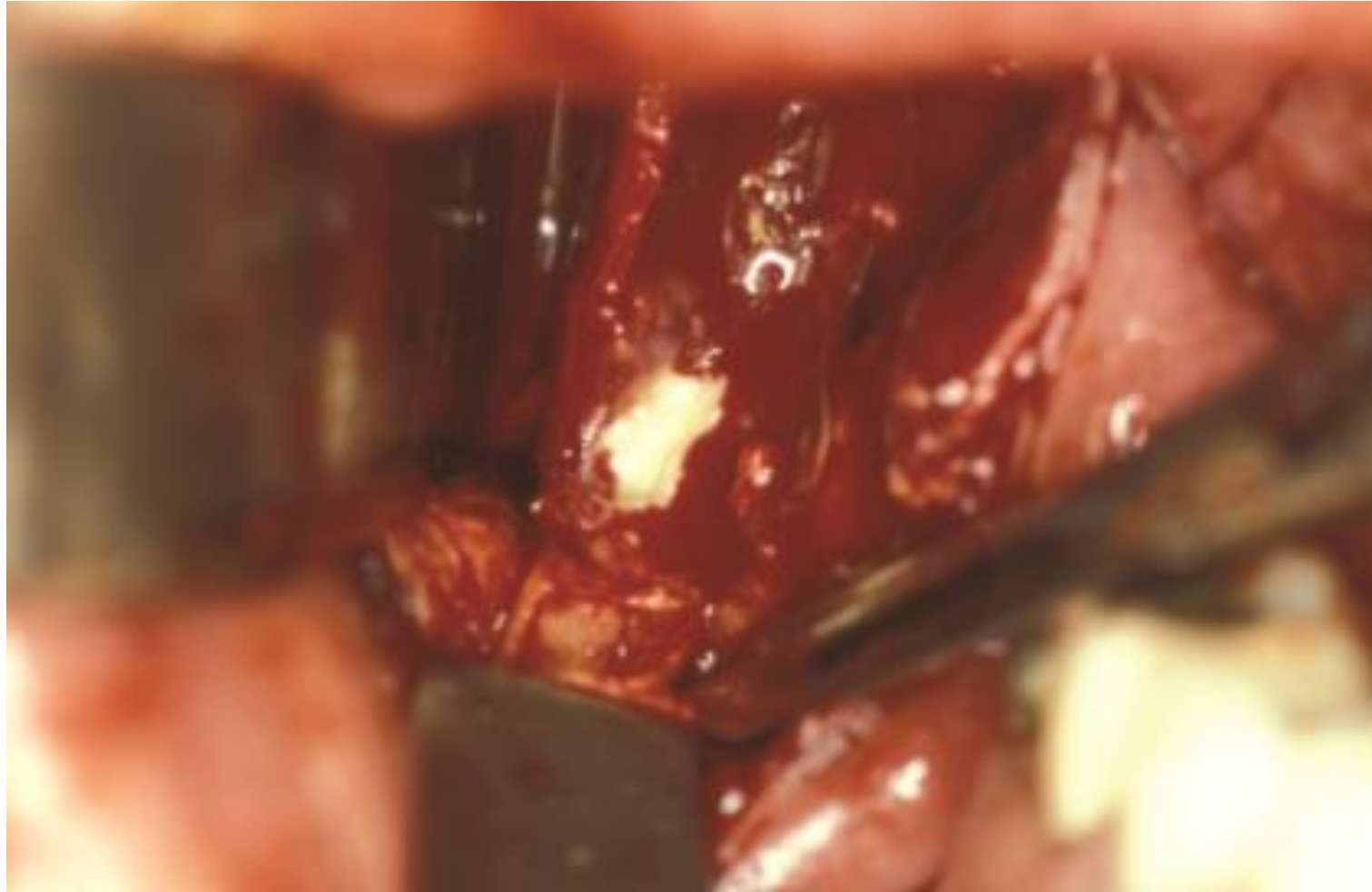
A multilocular cyst of the jaw is most likely to be.... **Keratocyst**

# Aspiration

- Cheesy white material suggests a keratocyst/ KOT.
- Solid mass suggests a possible
- Pus indicates an infected cyst or abscess (also foul smell).

# Aspiration

- Blood can suggest either an aneurysmal bone cyst or, more importantly, a vascular malformation.
- Air indicates that the needle is within the maxillary antrum or it indicates a solitary bone cyst.



An unfortunate rupture of a keratocyst (KOT) lining demonstrates the cheesy, sebaceous-like contents

## Various tests can be carried out on the aspirate:

- Culture and sensitivity – this is performed if infection is suspected.
- Stain for keratin – keratinized squames are suggestive of a KOT.
- Soluble protein content – KOTs have low protein content because the cyst is filled with keratin, which is mostly insoluble protein (less than 4 g/dl soluble protein). Cysts and tumours generally have soluble protein concentrations greater than 5 g/dl.

■ Electrophoresis – this is not often used now but the protein bands are compared with normal serum as a control. The procedure can distinguish KOTs because the keratin has little soluble protein compared with serum.

# **Incisional biopsy**

If a lesion is very large or there is suspicion that it is more than a simple cyst (e.g. KOT or ameloblastoma), then a biopsy is indicated.



# Surgical treatment

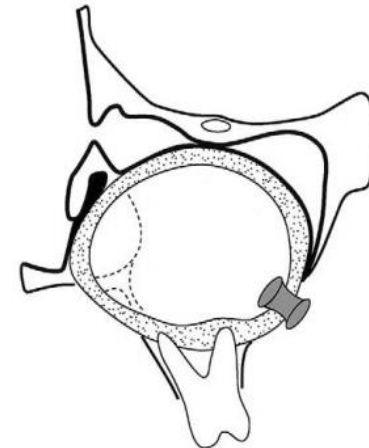
## Enucleation (termed cystectomy)

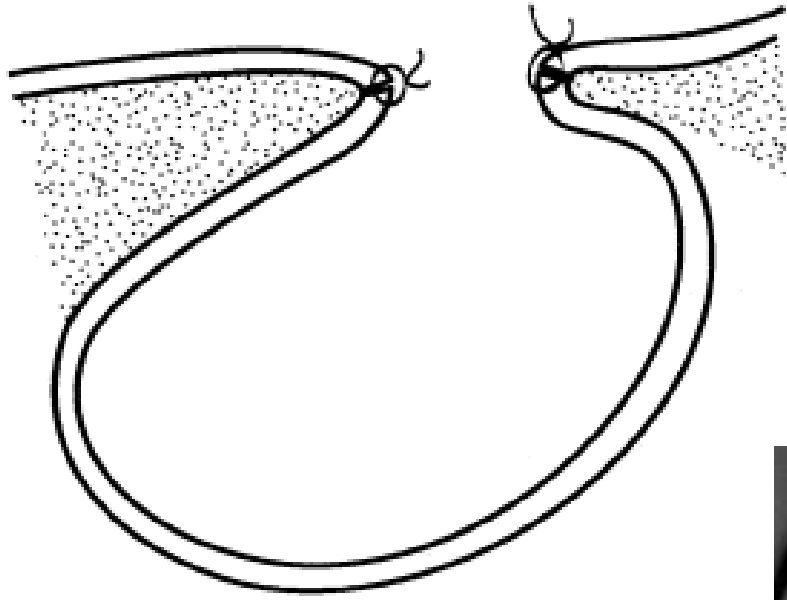
Most cysts are managed by enucleation. This involves stripping away the cyst lining from the resorbed bony cavity; the result is a clean ‘hole’ in the bone. This deficit is filled by blood, which organizes into osteoid and then into new bone.



# Marsupialization (termed cystostomy or Partsch I operation in Germany)

Marsupialization, on the other hand, involves converting the cyst into a pouch. (The word marsupial is derived from the Greek for “pouch. By converting the cyst to a pouch, the lesion is decompressed





# **Marsupialization**

At the time, this method was put forward as the treatment of choice, because without antibiotics any attempt at enucleation and primary closure of a cyst was accompanied by a very high postoperative infection rate.

# **Marsupialization**

## **Indications:**

- 1-Larg cyst can cause fracture of mandible**
- 2-Developing dentition**
- 3-Medically compromised patient**

## **If Marsupialization is Used for Complete Resolution**

1. The patient must be cooperative and irrigate the cyst at least twice a day.
2. A stent may need to be placed in the cyst to maintain the opening.
3. Studies show that complete elimination of the cyst is possible with marsupialization.

4. The cyst lining changes to resemble normal oral mucosa

5-Marsupialization can take a year or longer to perform



# Primordial Cyst (Keratocyst)

The several misleading implications lead to controversy regarding the name. Keratocystic odontogenic tumors (KOTs).

Gorlin-Goltz Syndrome????

# Concepts of Recurrences

There are several concepts of frequent recurrence of primordical cysts as follows:

1-Occurrence of satellite cysts, which are, retained during an enucleation procedure. There may be formation of new cysts rather than recurrences.

2-The cystic linings are very thin and fragile, and therefore difficult to enucleate, and part of the lining may be left behind, and constitute the origin of recurrences

3-Toller in 1967 suggested that epithelial lining of cysts have an **intrinsic growth potential** and regards a primordial cysts as being a neoplasm

# Treatment

## 1. Total enucleation and primary closer

According to Peterson, enucleation, by definition, means removal of the whole cyst without rupture. It should be performed carefully to remove the cyst in 1 piece, without fragmentation, which reduces the chance of recurrence because it increases the probability of full removal of the lesion.

Limitation: Daughter cysts can left behind

# Treatment

**2-Enucleation followed by chemical fixation.**

The Cornoy's solution acts as chemo-cauterization to prevent recurrence by **damaging daughter cysts** .

## **Composition of Cornoy's solution**

Glacial acetic acid 1 cc

Absolute alcohol 6 cc

Spirit chloroform 3 cc

Ferric chloride 1 grain

# Treatment

## 3-Enucleation followed by liquid N<sub>2</sub>

Liquid N<sub>2</sub> spray acts to destroy the remanence of cystic lining. Cryotherapy kills cells by means of direct damage to the intracellular and extracellular surfaces because of the formation of ice crystals that affect the osmotic and electrolytic balance.

# **Advantage of Liquid nitrogen**

1-Liquid nitrogen preserves inorganic bone structures, in contrast to Carnoy solution, which destroys osteogenic and osteoconductive properties.

2-Reconstructions can be performed immediately, which prevents pathologic fractures



# **Advantage of Liquid nitrogen**

3-It has been shown that liquid nitrogen cryospray devitalizes an area between 1 and 2 mm beyond the visible margins of the lesion, which should be adequate for most lesions

# **Advantage of Liquid nitrogen**

4-A temperature of  $-20^{\circ}\text{C}$  is required to devitalize tissues, and only liquid nitrogen can deliver this on a consistent basis.

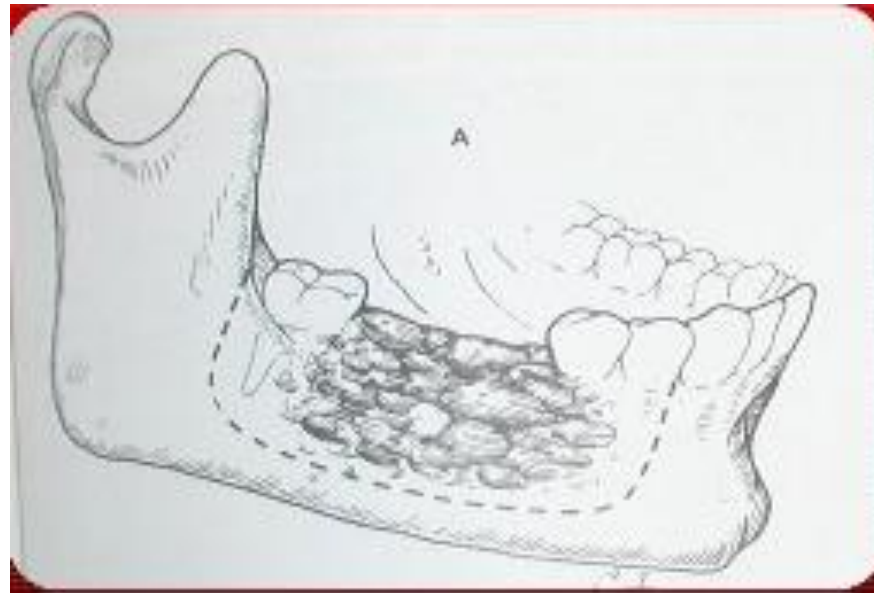
# **Advantage of Liquid nitrogen**

5-When the liquid nitrogen cryotherapy is given around the inferior alveolar nerve, it is affected, and patients will suffer paresthesia or anesthesia. However, the axon sheaths are left intact and nerve regrowth is normal such that most patients obtain partial or complete return of sensation in 3 months.

# Treatment

## 4-En-bloc resection of keratocyst

Marginal or segmental resection without disruption of the continuity of the mandible



# Odontogenic keratocysts

Although it was always thought by some that odontogenic keratocysts could be marsupialized, **this has not been the treatment of choice**, and in fact in the treatment of the odontogenic keratocyst has become more aggressive over the years in order to combat the known recurrence rate

# Nonepithelial cysts

These cysts are sometimes referred to as ‘pseudocysts’ because they do not have an epithelial lining. They are fluid-filled cavities within the bone and can be broadly divided into three types:

- Aneurysmal bone cyst..... Simple curettage
- Solitary bone cyst..... Simple curettage
- Stafne’s idiopathic bone ‘cyst’..No treatment
- Eruption cyst..... Regresses after eruption of the tooth