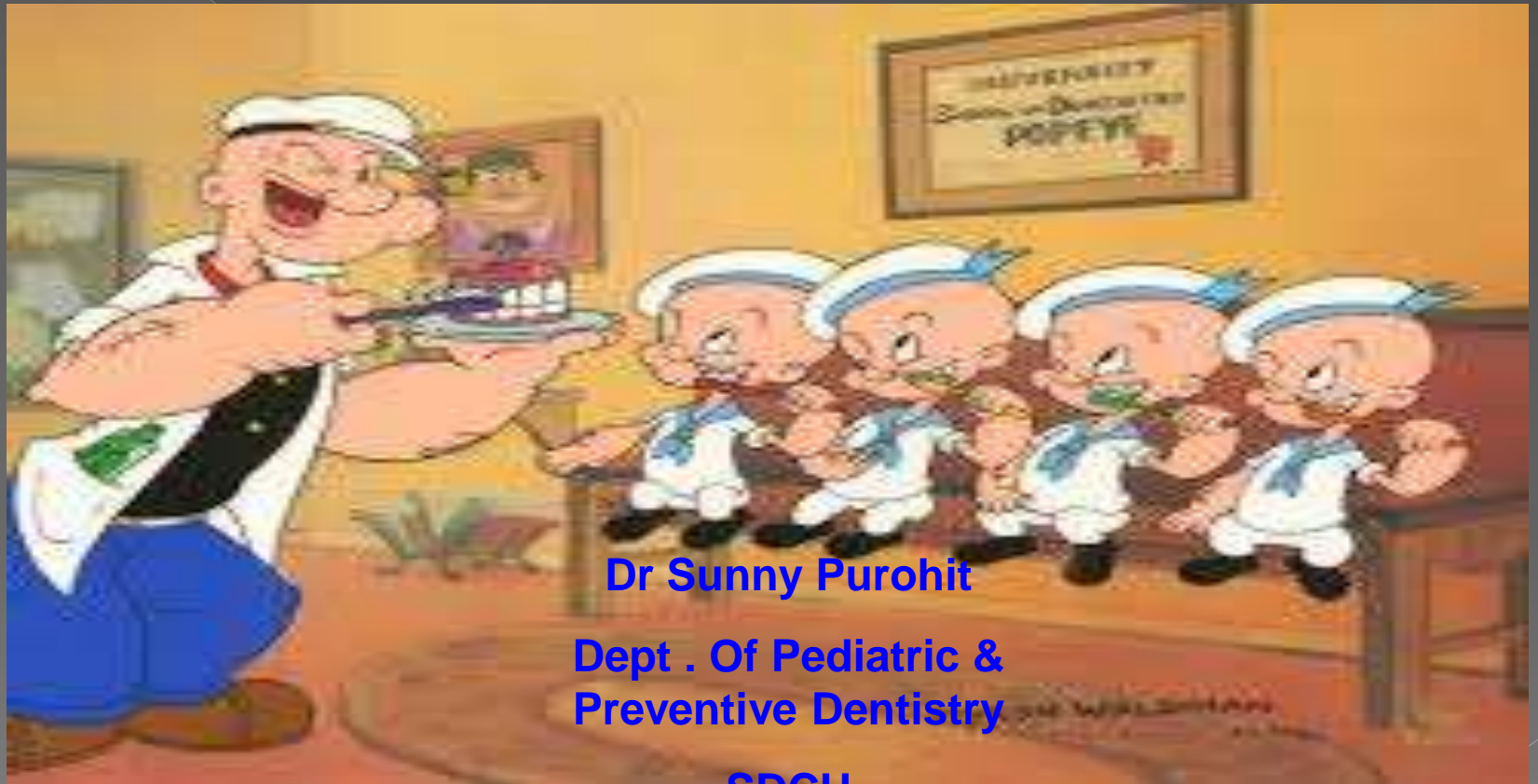


# Avulsion

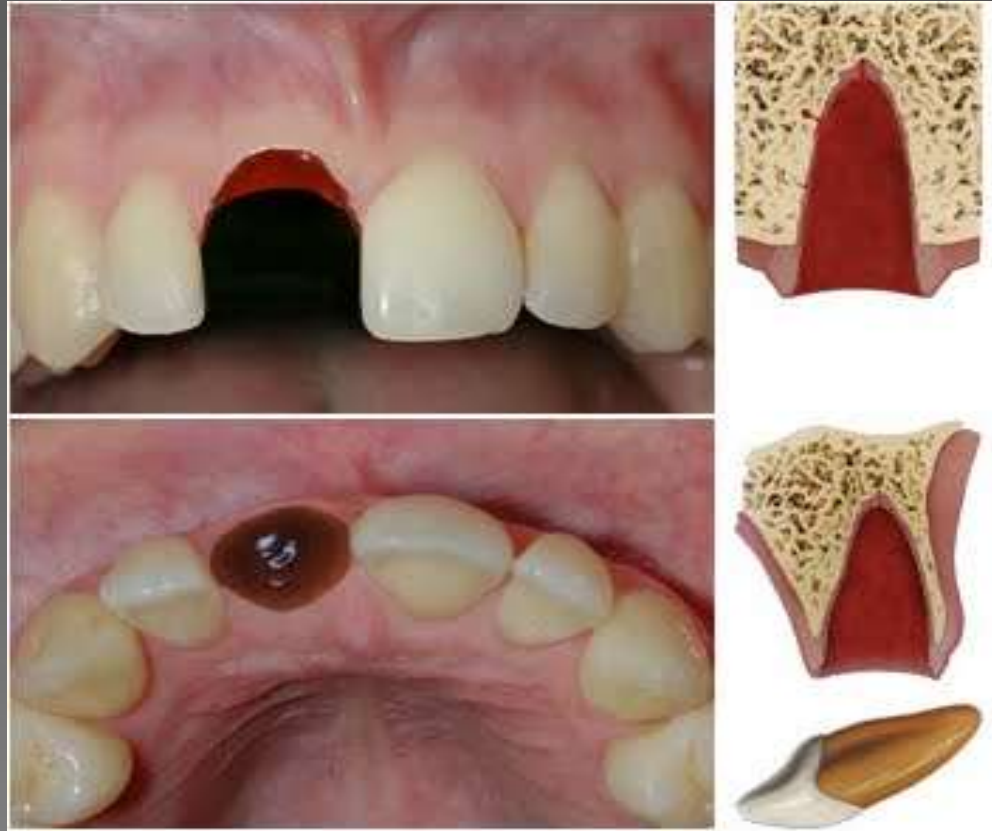


**Dr Sunny Purohit**

**Dept . Of Pediatric &  
Preventive Dentistry**

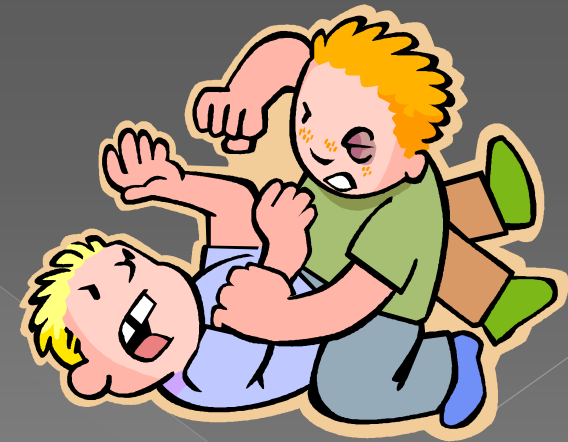
**SDCH**

**Dental avulsion** is the complete displacement of a tooth from its socket in alveolar bone owing to trauma



# CAUSES

- Trauma to the face and mouth from sports or other accidents can cause teeth to fracture, loosen or even knocked completely out of its socket (avulsion)..



- **Pathophysiology**

- **Maintenance of normal cell metabolism**

- Normally metabolizing tooth root cells have an internal cell pressure of 280-300 mOs and a pH of 7.2. When there is an uninterrupted blood supply, all of the metabolites (calcium, phosphate, potassium) and glucose that the cells require are provided.



- within 15 minutes most of the stored metabolites have been depleted and the cells will begin to die. Within one to two hours, enough cells will die that rejection of the tooth by the body

# Pathophysiology

- Research has shown that the critical factor for reduction of the death of the tooth root cells and the subsequent root replacement resorption following reimplantation of knocked-out teeth is maintenance of normal cell physiology and metabolism of the cells left on the tooth root while the tooth is out of the socket. In order to maintain this normalcy, the environment in which the teeth are stored must supply the optimum internal cell pressure, cell nutrients and pH.

# Storage media

- ⦿ There are many storage media available for knocked-out tooth storage. The most often recommended are: saliva,
- ⦿ physiologic saline, milk and pH balanced cell preserving fluids
- ⦿ Saliva-Micro org-socket

# Milk

- Milk has been also recommended as a storage medium for avulsed teeth. Its advantage is the high availability of fresh whole milk. Only whole milk can be used for tooth preservation. Skim milk and heavy cream do not have the correct fluid pressure and will cause damage to the root cells

# Judgement of PDL Injury

- PDL-Viable-Replanted immediately or after a very short time (<15 Mins)
- PDL-Viable but compromised-Tooth stored in HBSS/Milk/Saline/Saliva Etc & total Extra Oral dry time <60 Mins
- PDL-non Viable-Extra oral dry time >60 Mins



## **Management can be divided into**

- ◎ A. Management at site of injury
- ◎ B. Management in the dental office

# Management at site of injury.

- ◉ Replant immediately. If possible. Rinse with water before replanting if the tooth is contaminated. When immediate replantation is not possible, place tooth in the best available transport medium available.



- Recently, an avulsed tooth preserving system called – ‘SAVE A TOOTH’ containing Hank’s balanced salt solution(HBSS), a pH preserving fluid and trauma reducing suspension apparatus is available.
- It may be used in serious accidents that relegate replantation to secondary importance and hence replanted when crisis is over.



# **Management in the dental office**

- ⦿ i) Replantation of tooth.
- ⦿ If tooth has been in any physiological storage media, replant immediately..
- ⦿ If extra oral dry time is less then 15 min, replant immediately if the root apex is closed, subsequently root canal therapy may be required. If the root apex is open replant the tooth and monitor the tooth for pulpal pathosis.



# Management of the root surface

- ◉ Keep the tooth moist at all times
- ◉ Do not touch the root surface {hold tooth by the crown}
- ◉ Do not scrape or brush the root surface or remove the tip of the root.
- ◉ If the root appears clean, replant as it is after rinsing with saline.

- If the root surface is contaminated, rinse with Hank's balanced salt solution (HBSS) or saline (use tap water if above are not available)



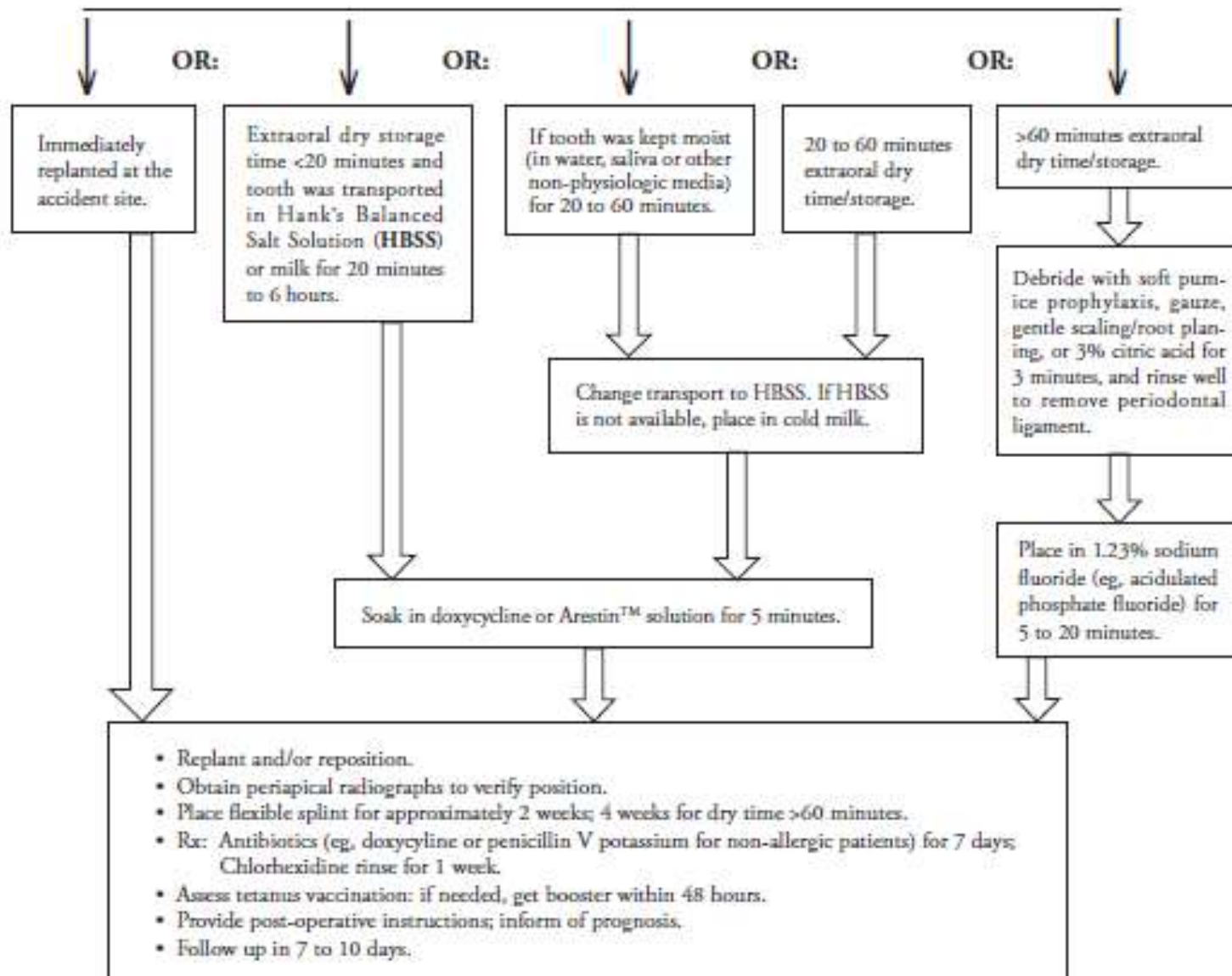


## Management of an Avulsed Permanent Incisor with an Open Apex (Apex $\geq 1$ mm)\*

Assess medical history and rule out any neurologic and nondental injuries.

Diagnostic tests:

- Rule out alveolar fracture.
- 3 radiographs angulated differently to rule out root fractures.
- Pulp vitality test maxillary and mandibular anteriors.

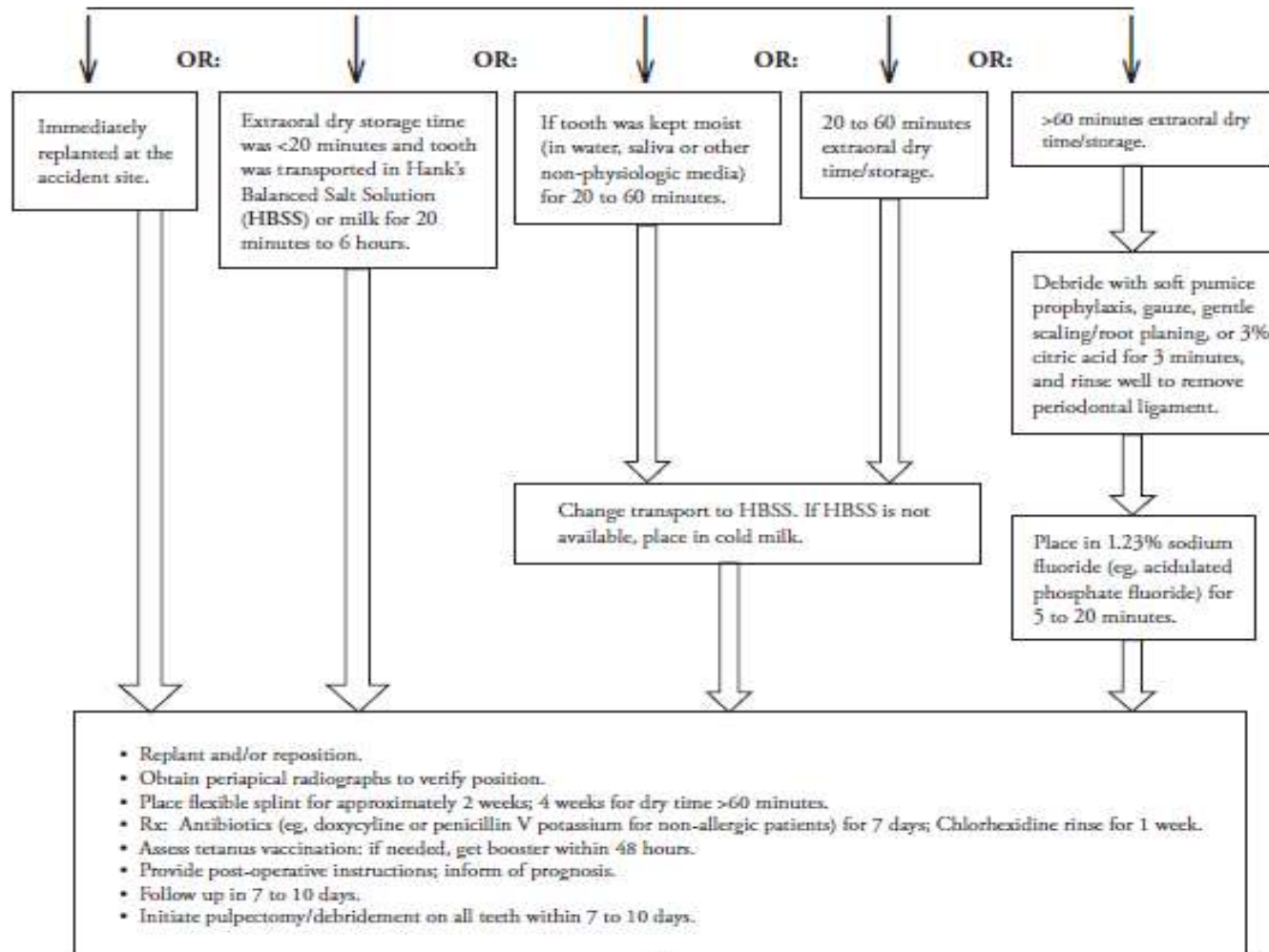


## Management of an Avulsed Permanent Incisor with an Closed Apex (Apex <1 mm)\*

Assess medical history and rule out any neurologic and nondental injuries.

Diagnostic tests:

- Rule out alveolar fracture.
- 3 radiographs angulated differently to rule out root fractures.
- Pulp vitality test maxillary and mandibular anteriors.



# Management of the socket

- ◉ Do not curette the socket. If a clot is present, use light irrigation with saline.
- ◉ Do not make a surgical flap unless bony fragments prevent replantation.
- ◉ If the alveolar bone is collapsed and prevents replantation carefully insert a blunt instrument into the socket to reposition the bone to its original position. After replantation manually compress facial and lingual bony plates .

# Splinting

- ◎ Use acid-etch resin alone or with soft arch wire, or use orthodontic brackets with passive arch wire. Suture in place only if alternative splinting methods are unavailable (Circumferential wire splints are contraindicated).
- ◎ Splint should remain in place for 7-10 days However if tooth demonstrates excessive mobility splint should be maintained until mobility reduces







- ◎ Bone fractures resulting in mobility usually require longer splinting periods (2-8 weeks)
- ◎ Home care instructions during splinting period include:
  - ◎ ☐ Do not bite on splinted teeth
  - ◎ ☐ Soft diet
  - ◎ ☐ Maintenance of good oral hygiene .

## Adjunctive drug therapy:

- ◉ Oral/systemic antibiotics
- ◉ Referral to physician for tetanus prophylaxis within 48 hours.
- ◉ Chlorhexidine rinses
- ◉ Analgesics





## ◎ Complications:

- ◎ Potential complications of replantation are
- ◎ 1) Inflammatory resorption
- ◎ 2) Replacement resorption
- ◎ 3) Ankylosis
- ◎ 4) Tooth submergence

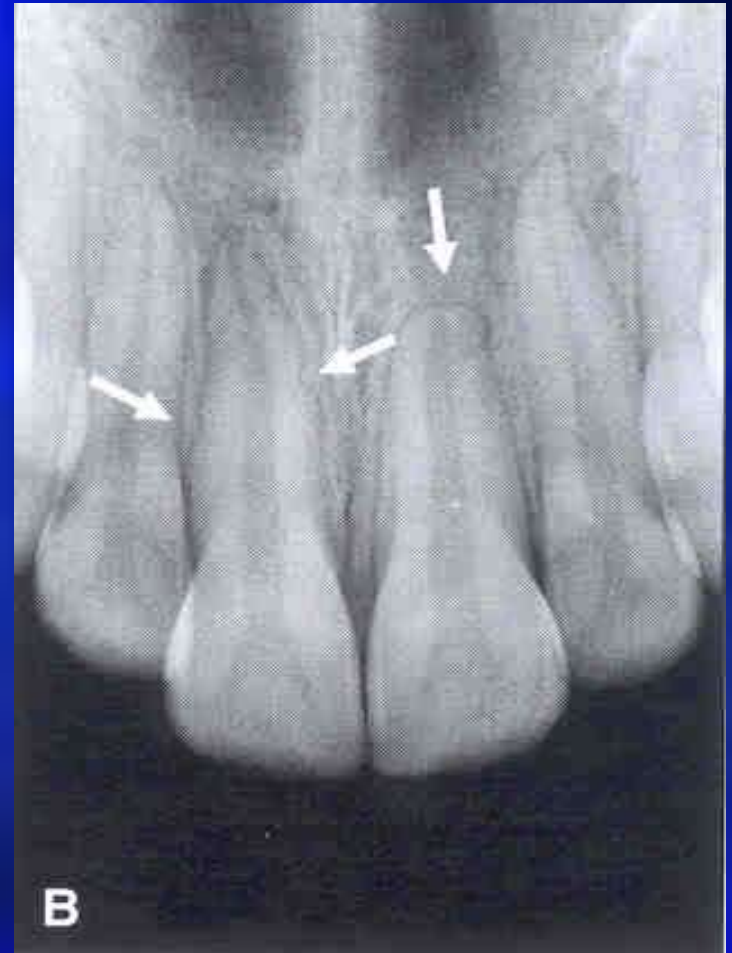
# WOUND HEALING AFTER REPLANTATION

- Surface resorption
- Replacement resorption
- Inflammatory root resorption

# Surface resorption

**Surface resorption** is manifested as a excavations on the root surface without associated breakdown of the lamina dura.

# Surface resorption

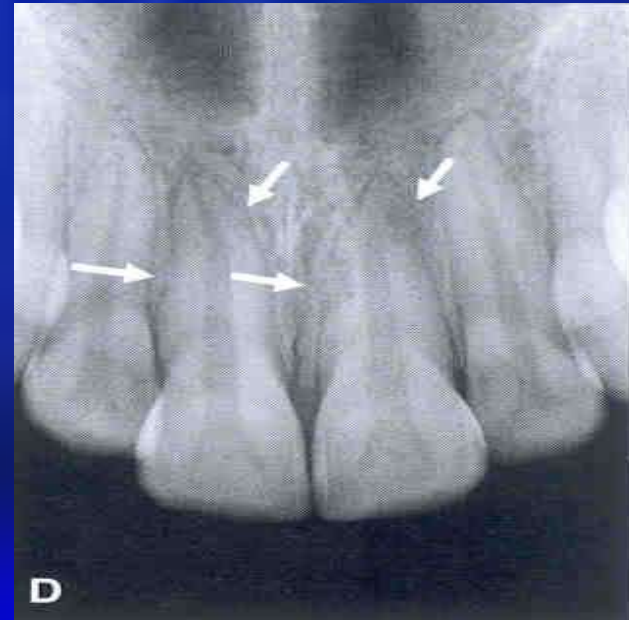
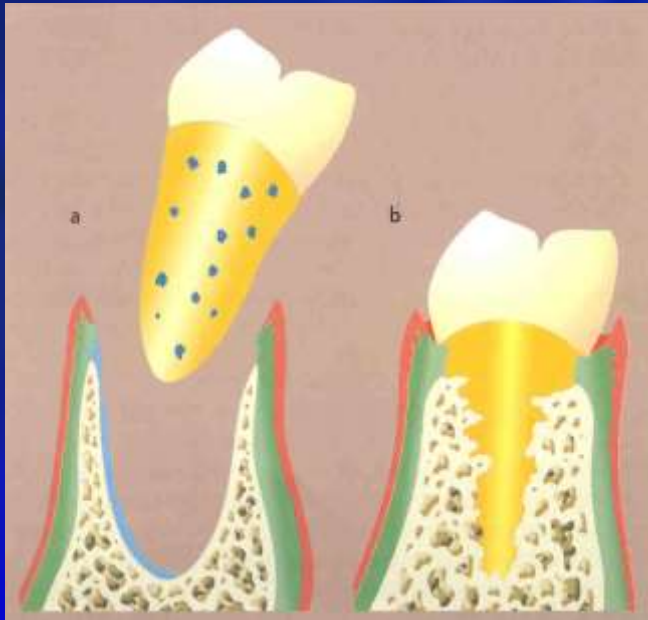


# Replacement resorption

Replacement resorption (ankylosis) is initially seen as a disappearance of PDL space, later follow by a substitution with bone.

# Replacement resorption

- PDL injury -> inflammation -> osteoclastic activity -> fusion between bone and root surface

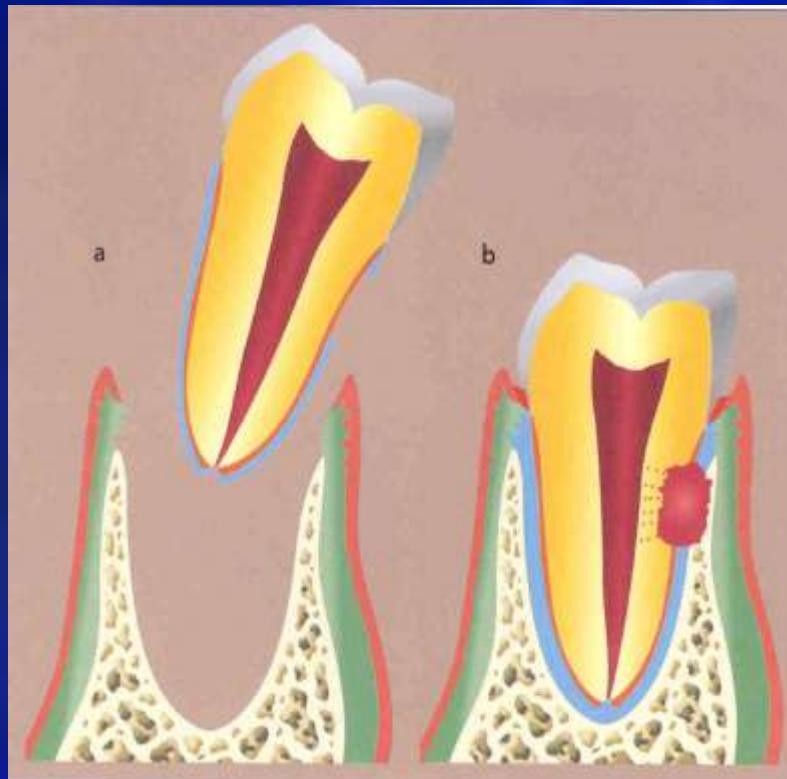


# **Inflammatory resorption**

**Inflammatory resorption** is seen as bowl shaped cavities on the root surface with an associate radiolucency affecting the lamina dura.



# Inflammatory resorption





THANK YOU