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An orange horizontal bar is located at the top left of the page. The background of the entire slide is a soft-focus photograph of a woman and a young girl, both smiling broadly, showing their teeth. The woman is on the left, and the girl is on the right, slightly in the foreground.

Dental Trauma in the Pediatric Sports Population

Incidence, Prevention, and
Management for Sports Doctors and
Pediatricians

The Scope of the Problem

Pediatric sports-related dental injuries represent a significant public health concern affecting thousands of young athletes annually.

22K

Annual Injuries

Dental injuries in U.S. children under 18 due to sports activities (AAPD)

10-61%

Trauma Rate

Of young athletes experience dental trauma during their sports participation

31.8%

Facial Injuries

Dental trauma accounts for nearly one-third of all pediatric facial injuries in sports

High-Risk Sports by Age

- **Ages 7-12:** Baseball leads injury statistics
- **Ages 13-17:** Basketball causes most injuries
- **All ages:** Football, hockey, and field hockey show elevated risk

Vulnerable Populations

Children under 7 years and males are disproportionately affected. Boys participating in contact sports face the highest risk of dental trauma.

Why Pediatric Athletes Are Vulnerable

-  **Developing Dentition**

Mixed dentition stages and incomplete root development increase the risk of complicated injuries. The transition from primary to permanent teeth creates unique vulnerabilities that adult athletes don't face.
-  **Limited Awareness**

Children's developing coordination and reduced hazard recognition contribute significantly to trauma incidence. Young athletes may not anticipate dangerous situations or protect themselves effectively.
-  **Injury Mechanisms**

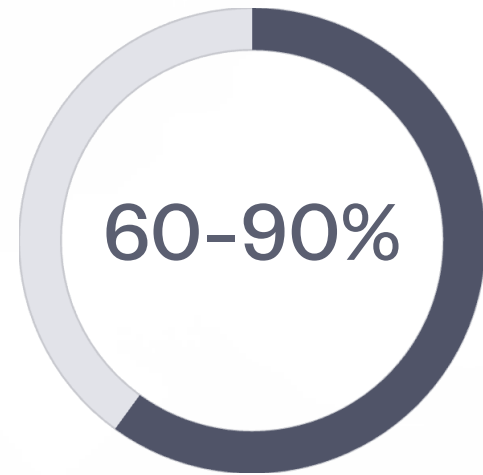
Contact with other players, collisions, falls, and impact from sports equipment are the primary mechanisms of dental injury in pediatric sports activities.
-  **Long-Term Impact**

Beyond immediate pain and trauma, psychological effects can be significant. Lifetime treatment costs for a single injured tooth can exceed \$20,000, creating substantial economic burden for families.



Prevention: The Power of Protective Equipment

Proper protective equipment is the most effective strategy for preventing sports-related dental injuries. Evidence overwhelmingly supports the use of mouthguards and other protective gear.



Risk Reduction

Custom-fabricated mouthguards reduce dental injury risk

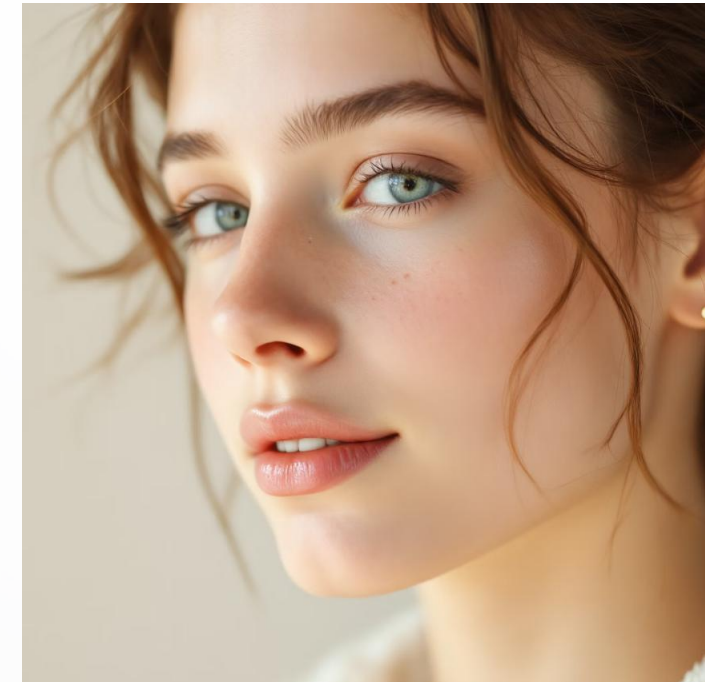
Sports with Mandatory Protection

- Football (all levels)
- Ice hockey
- Lacrosse
- Field hockey
- Wrestling (especially with braces)

Comprehensive protection matters: Helmets, facemasks, and mouthguards together significantly reduce both injury frequency and severity according to AAPD policy recommendations.

Protection Gap

Sports like baseball, basketball, soccer, and gymnastics show high injury rates but lag in protective gear adoption. Policy changes could prevent thousands of injuries annually.



Choosing the Right Mouthguard for Pediatric Athletes



Custom-Made Mouthguards

Gold Standard Protection

- Superior fit and comfort
- Maximum protection against dental injury
- Reduced concussion risk
- Better retention during play
- Allows normal breathing and speaking

Best for: All competitive athletes when feasible

Boil-and-Bite Mouthguards

Practical Alternative

- Moldable to individual teeth
- More affordable option
- Good fit when properly formed
- Ideal during mixed dentition
- Recommended for athletes with braces

Best for: For a quick fix and

Stock Mouthguards

Least Recommended

- One-size-fits-all design
- Poor retention
- Interferes with breathing
- Limits communication
- Minimal protection

Not recommended for regular sports use

Athletes that
are most
vulnerable



Patients with
a large overjet



- Patients with anterior open bite tend to have poor lip coverage





Patients with orthodontic brackets

- Soft tissue are susceptible to cuts and bruises due to the wires and brackets
- Potential for significant luxation injuries as the teeth are already in mobile state

Athletically
gifted but
dentally
vulnerable!





Dental Injuries in Young Athletes

Tooth Fractures

Chipped or broken teeth are frequent injuries among young athletes and require timely dental assessment for best outcomes.

Luxation Injuries

Luxation involves displacement of the tooth without complete loss. Immediate care can help preserve the tooth's function and position.

Avulsion Injuries

Avulsion is when a tooth is completely knocked out, needing urgent attention to improve chances of saving the tooth.

Jaw Fracture

One study of US 10.6% of pediatric facial fractures are sports related and different studies claim an incidence of 7.2% -- 31% of these fractures tend to be mandibular fractures

Dealing with dental trauma on the field

**First Response –
What to do when**

ABC's of Dental Trauma

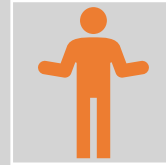
A = Alertness

B = Bleeding

C = Care



Alertness



Check for signs of dizziness or non responsiveness.



Try to rule out shock.

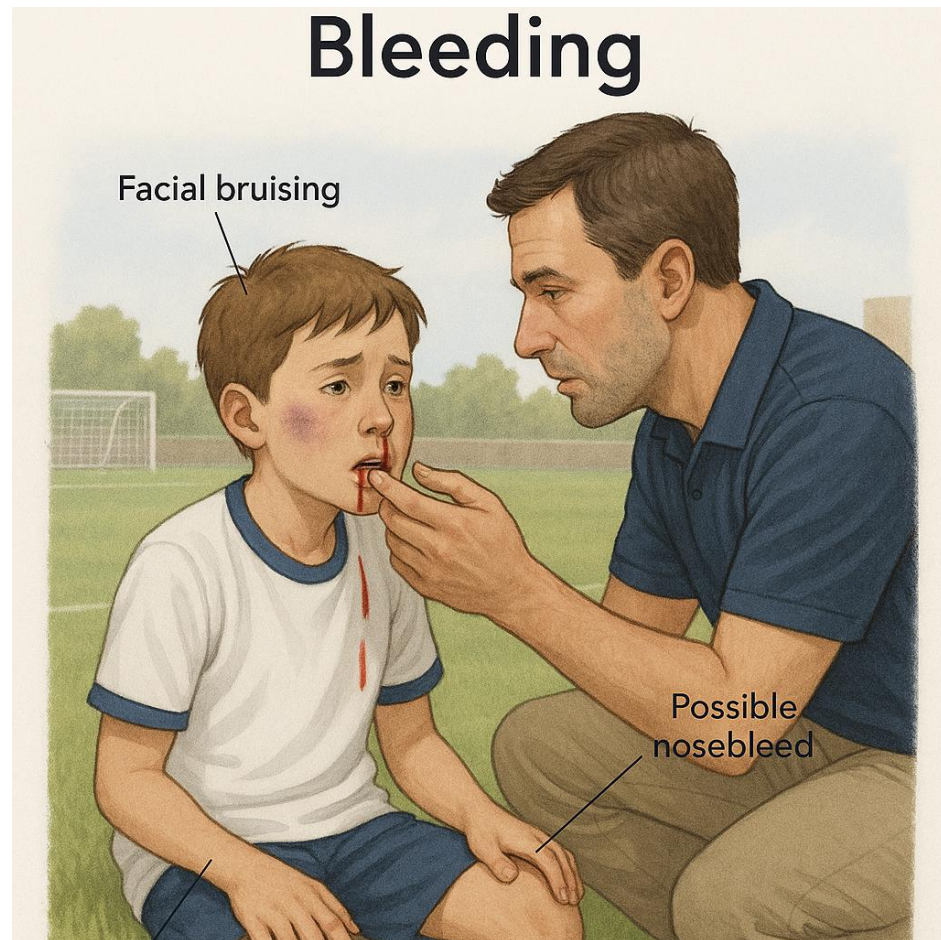


Check for head injury and or patient complaining of headache



This would necessitate medical referral for monitoring and neurological follow up.

Bleeding



Check for bleeding inside the mouth. Check for signs of laceration through the body of maxilla or mandible-including ecchymosis in the floor of the mouth.



Bleeding or fluid from the nose – possible Le Fort 2 fracture



Bleeding from the gums – sign of subluxation, fracture, intrusion or extrusion of the tooth



Bleeding from a fractured tooth – sign of pulp exposure

Care

(What happens after the injury)



Bleeding assessed – in the mouth or from the gingival sulcus



If avulsion, how was the tooth handled? What are the next steps?



Misalignment of the teeth



Were fractured pieces of tooth recovered?

Intra oral exam

Soft tissues – lips, tongue, cheeks, gingiva

Hematoma under the upper lip may suggest maxillary fracture

Hematoma under the tongue in the floor of the mouth may suggest mandibular fracture

Palpate the gums to assess for fracture of the alveolar bone

Assess for bleeding from the sulcus of the tooth – indicates damage to the periodontium of the tooth. Usually suggests trauma such as subluxation and root fracture

Check for displacement of teeth and mobility

Signs of Mandibular fracture

Occlusion is off

Unilateral open bite,
Anterior open bite

Paresthesia

Trismus

Inability to close
mouth – fracture of
alveolar process, angle
of ramus or symphysis

Laceration and
Ecchymosis

Mandibular Jaw fracture



Anterior Open Bite

Unilateral open bite

Laceration through gingiva

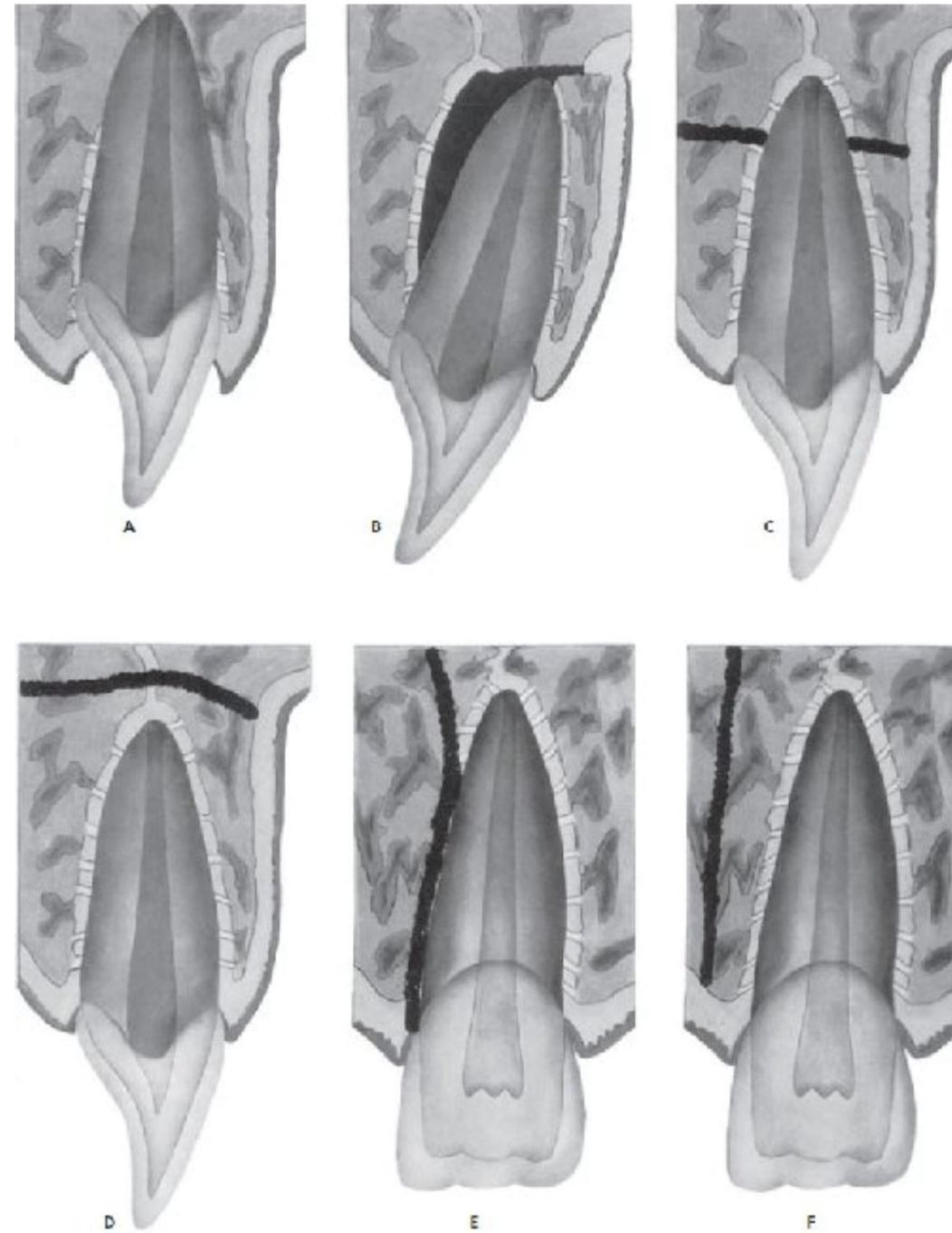
Separation of the teeth



Maxillary fracture

1. Frequent presentation is the fracture of the alveolar process
2. Other than the subluxation of the teeth, you may find that the entire buccal plate of bone is mobile
3. There may also be root fractures associated with this injury
4. Needs immediate management

Alveolar fractures



Avulsion



Management

Find the avulsed tooth and handle it carefully without touching the root surface if possible

Rinse the root surface with distilled or sterile water

Rinse injured area in the mouth with sterile water and clean out the debris

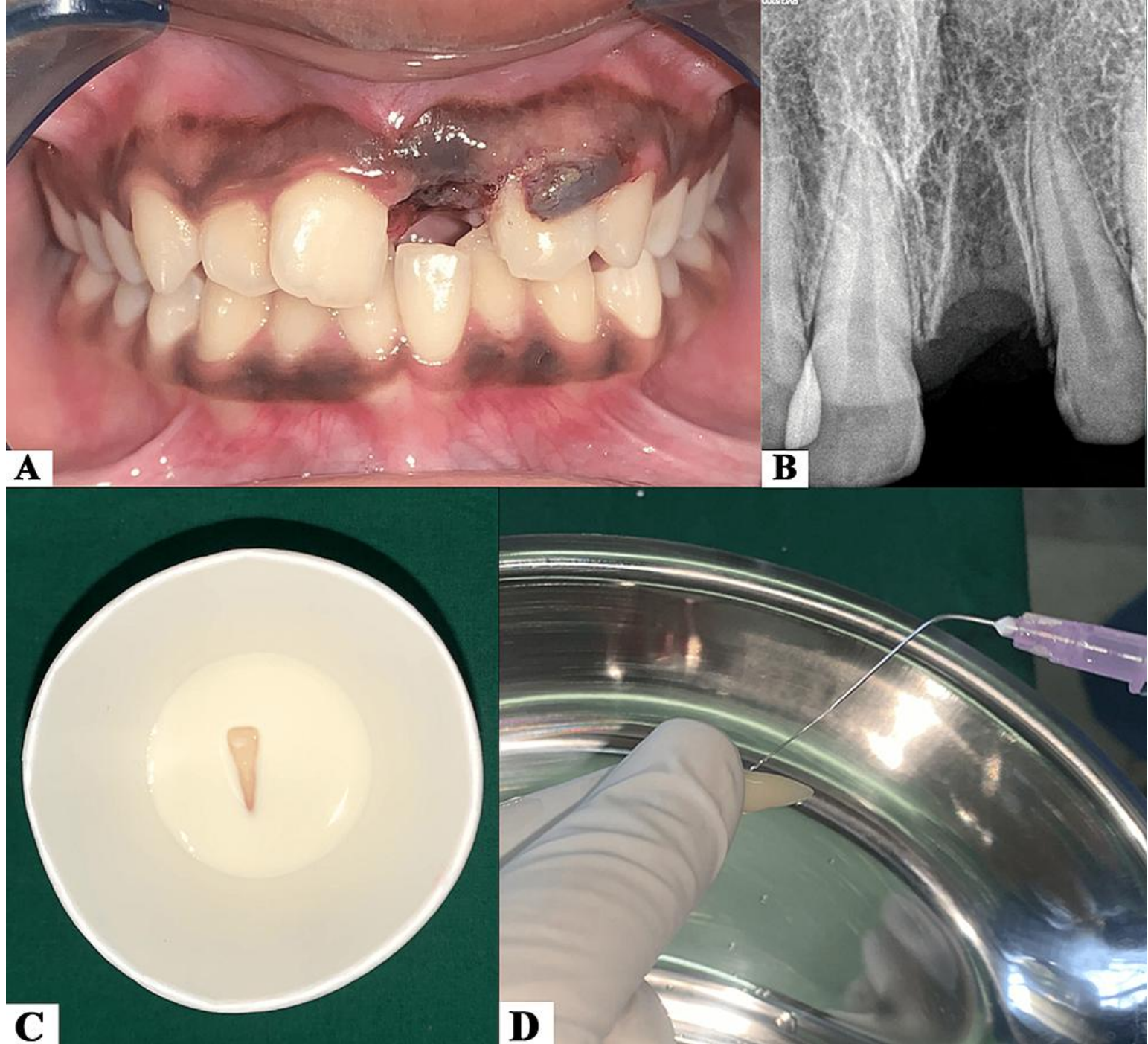
Grasp the tooth by the crown and place it into the socket

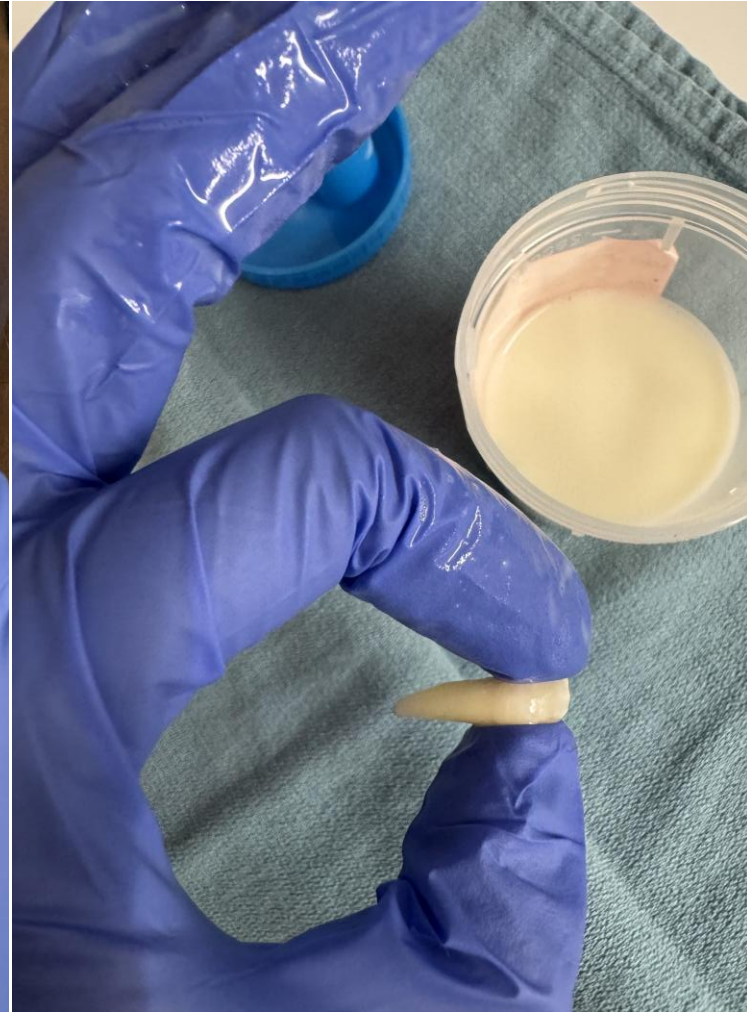
Timing is critical!!! Must be re implanted within 5-10 minutes

Transport patient to dentist for further care.

DO NOT RE IMPLANT A PRIMARY TOOTH INTO THE SOCKET! THIS WILL LEAD TO DAMAGE OF THE UNDERLYING ADULT TOOTH

Reinsertion





Re implantation case

- Avulsed lateral incisor re implanted and splinted. Two central incisors were never recovered

Photos and treatment courtesy of Dr. Anik Babul

Best options
for
preserving
the tooth

Storage Media for Avulsed Tooth

Milk



- Easy to obtain
- Maintains tooth integrity
- Readily available

Save-A-Tooth



- Maintain viability of tooth
- Increases chance of successful re-implantation
- Easily available

Comparison of Milk and HBSS

Milk

- Good for preserving PDL fibers
- 2-6 hours stability
- Easy to obtain
- Good pH and ideal osmolarity
- Contains nutrients

HBSS

- Best for preserving PDL fibers
- Up to 24 hrs
- Solution created to mimic natural cell environment
- Ideal pH and osmolarity

Saliva is the last resort but do not use water even if its sterile – will lead to cell lysis

Coronal fracture



Management



Find the fractured portion of the tooth



Save it in a sterile gauze if possible



Athlete may return to play if no evidence of bleeding from within the tooth and if athlete is not in pain



Athlete should not return to play if bleeding is visible and should be referred to dentist for evaluation and care

Minor fracture- does not require immediate assistance



Major fracture-requires immediate assistance



Foreign Bodies !

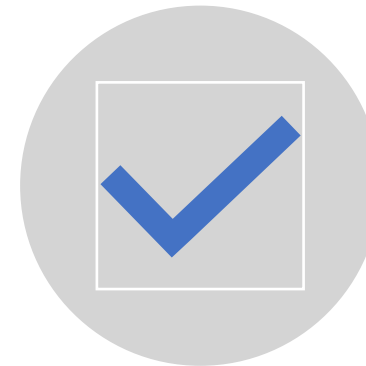




Intrusion



MANAGEMENT



ASSESS FOR ANY ADDITIONAL SOFT
TISSUE INJURIES



TIMING IS CRITICAL. ATHLETE NEEDS
TO SEE A DENTAL PROFESSIONAL AS
SOON AS FEASIBLE

Extruded tooth



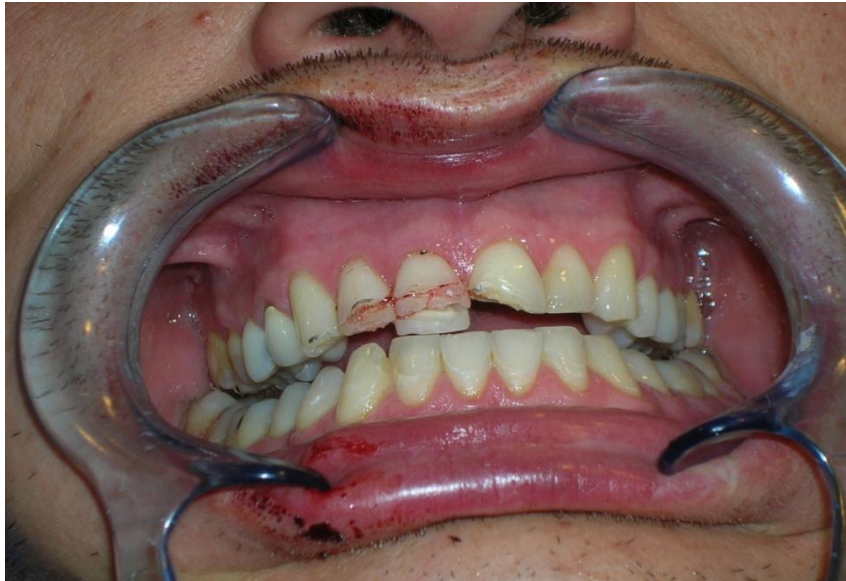
Management

Check for other soft tissue injuries

Attempt to push tooth back into place if tooth is mobile enough and the athlete is not in pain

If its a minor extrusion – patient finish the game if they are comfortable to do so.

Subluxation



Management



Movement of tooth/teeth but the tooth stays within the socket.



Attempt to place tooth back into position

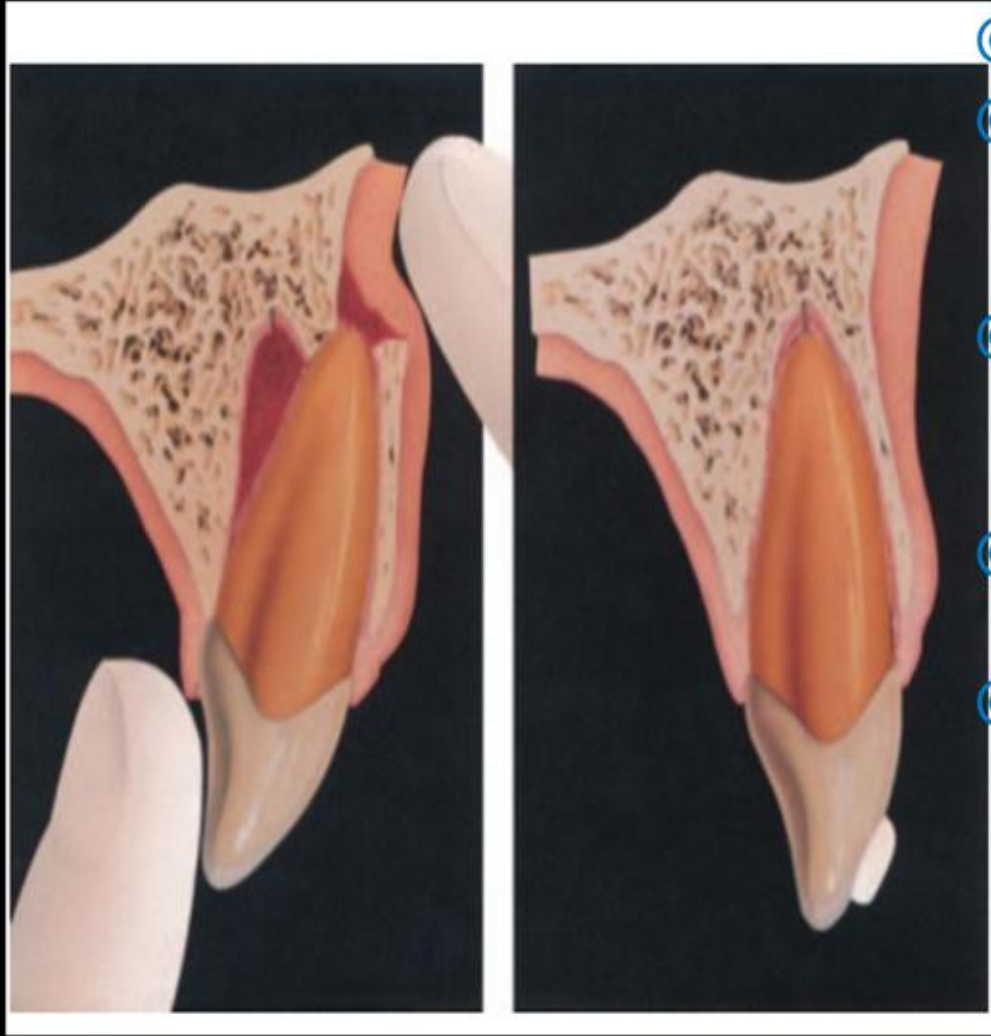


For primary teeth they can be left alone and monitored for spontaneous correction of the position.



Only time treatment is needed is if the subluxation is affecting the bite or function—depending on the severity, may require extraction.

Lateral subluxation



- Administer LA
- Push the tooth incisally and then palatal-apically to reposition
- Use forcep if movement cannot be achieved manually
- Splint 2 weeks (6 weeks if buccal bone fracture)
- If greater than 4 days repositioning will be difficult and may have to resort to orthodontic to correct



Injuries That Can Be Managed Later

Non-Urgent Injuries

While immediate care is ideal for all dental trauma, certain injuries can be managed with scheduled dental appointments rather than emergency intervention.

Minor Enamel Fractures

Fractures without pulp exposure can be treated electively within days. Smooth sharp edges to prevent soft tissue injury.

Primary Tooth Injuries

Often managed conservatively to avoid damaging permanent tooth buds beneath. Extraction may be preferred over aggressive intervention.

Minor Luxations

Slight mobility without significant displacement may be monitored with scheduled follow-up rather than emergency stabilization.



Follow-Up is Essential

Even "minor" injuries require monitoring for pulp vitality and root development. Schedule dental evaluation within 24-48 hours.

Risks of Delayed Treatment



Pulp Necrosis

Loss of blood supply leads to tooth death, requiring root canal treatment or extraction



Ankylosis



Root Resorption

Progressive loss of root structure compromises tooth stability and longevity



Eventual Tooth Loss



Classification & Immediate Management of Dental Injuries

Crown Fractures

- **Enamel Fracture:** Minor chip.
 - **Action:** Smooth sharp edges, no immediate referral needed unless symptomatic.
- **Enamel-Dentin Fracture:** Exposed dentin.
 - **Action:** Cover exposed dentin with temporary material within **24 hours**. Refer to dentist.
- **Complicated Crown Fracture:** Pulp exposure.
 - **Action:** IMMEDIATE referral to a dentist/endodontist within **1-2 hours** to preserve pulp vitality.

Root Fractures

- **Definition:** Fracture within the alveolar bone, often apical or mid-root.
- **Clinical Signs:** Tooth mobility, pain on biting, sometimes gingival bleeding.
- **Diagnosis:** Requires multiple angulated dental X-rays for confirmation.
- **Action:**
 - **Stabilize** mobile tooth if possible.
 - **Urgency:** IMMEDIATE dental referral (**within hours**) for definitive diagnosis and stabilization/treatment plan.

Displacement Injuries (Luxations)

- **Concussion/Subluxation:** No displacement, but tender/mobile.
 - **Action:** Soft diet, observe. Referral within **1-2 days** for baseline exam.
- **Extrusion:** Tooth partially out of socket.
 - **Action:** Gently reposition if possible, stabilize. **Urgent referral within 1 hour**.
- **Intrusion:** Tooth pushed into socket.
 - **Action:** Do NOT attempt to reposition. **Immediate referral within 1 hour** for assessment (spontaneous re-eruption vs. orthodontic/surgical repositioning).
- **Avulsion (Tooth knocked out):**
 - **Action:** Replant immediately on-site if possible. Store in milk/saline. **EMERGENCY referral within 30 minutes**.

Recent case



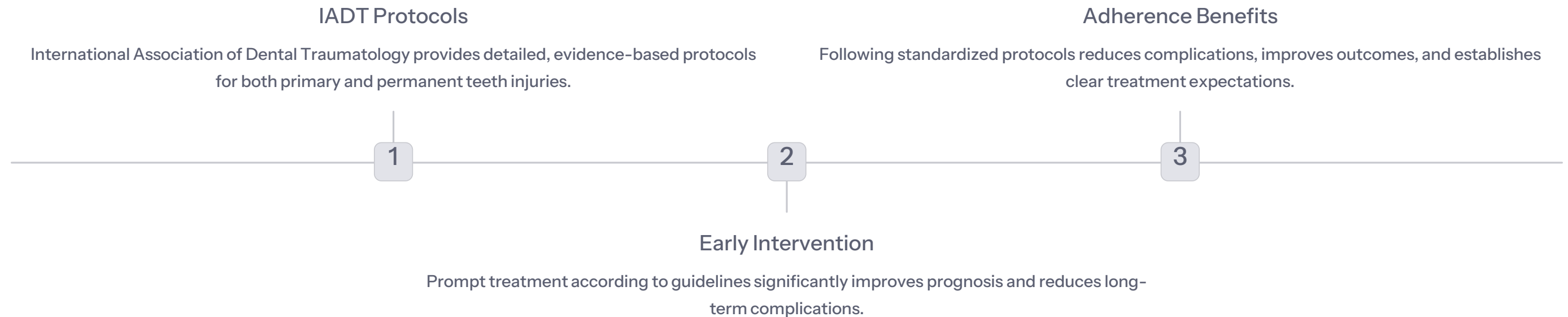
4 hours later...



Sometimes dental trauma can also be of the airborne-stretcher-carrier-sit-on-your-face variety



Evidence-Based Guidelines for Pediatric Dental Trauma



Role of Sports Doctors & Pediatricians

- Perform initial assessment and stabilization
- Recognize injuries requiring immediate dental referral
- Provide appropriate first aid and tooth preservation
- Document injury mechanism and extent
- Coordinate care with dental specialists
- Educate families on follow-up importance

Education is Critical

Beyond clinical care, physicians play a vital role in educating coaches, parents, and athletes about:

- Injury recognition and severity assessment
- Emergency response protocols
- Proper tooth handling and storage
- When to seek immediate vs. urgent care
- Prevention through protective equipment

"Early intervention improves prognosis." The first hour after dental trauma is crucial. Healthcare providers at sporting events can dramatically impact long-term outcomes through proper immediate management.

Thank You!

- Dr. Amin Babul
- Email draminbabul@gmail.com



Extra oral exam



Check	Check for bleeding <ul style="list-style-type: none">• Evidence of ecchymosis• Bleeding from the nose or subcutaneous haemorrhage - possible maxillary Le fort 1 or 2 fracture
Assess	Assess the bite <ul style="list-style-type: none">• check for trismus - inability to open mouth• Athlete may complain that they are able to bite properly – possible mandibular fracture or subluxation of tooth
Palpate	Palpate facial bones – pain indicates possible fracture

Clinical exam

