

# **Traumatic dental injuries: Intrusive luxation in permanent teeth**

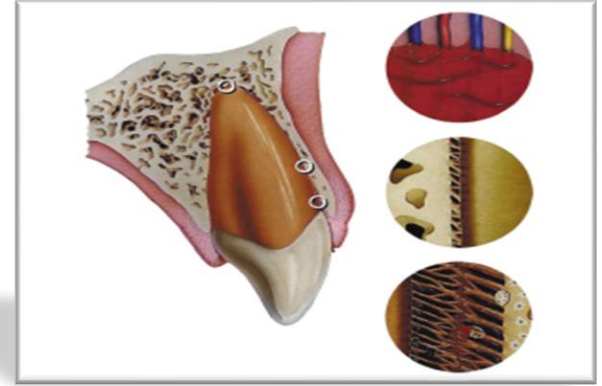
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# Objectives

- Terminology and definitions.
- Epidemiology and etiology.
- Pathophysiology.
- Clinical and radiographic presentation.
- Management and possible outcomes.
- Case presentation.

## Definition

dislocation of a tooth in an axial direction into the alveolar bone.



- It could be complete when the tooth is enveloped by surrounding tissues.
- or partial when the incisal border of the crown is visible.

# Epidemiology

✓ Intrusive luxation of permanent teeth is a rare trauma entity.

✓ It represent 0.5-2% of trauma affecting the permanent dentition.

Prevalence of traumatic dental injuries to permanent teeth in 12-year-olds (percent).

Type of dental trauma	N (%)		
	Female	Male	Total*
Dental hard tissue and pulp injury			
Enamel infraction	1 (1)	0 (0)	1 (<1)
Enamel fracture	4 (3)	7 (3)	11 (3)
Enamel/dentin fracture	92 (62)	127(52)	219 (56)
Complicated crown fracture	25 (17)	59 (24)	84 (21)
Complicated crown-root fracture	4 (3)	3 (1)	7 (2)
Root fracture	5 (3)	1 (<1)	6 (1)
Periodontal tissue injury			
Subluxation	5 (3)	16 (7)	21 (5)
Lateral luxation	1 (1)	15 (6)	16 (4)
<b>Intrusive luxation</b>	8 (5)	6 (2)	<b>14 (4)</b>
Extrusive luxation	3 (2)	3 (1)	6 (2)
Avulsion	0 (0)	7 (3)	7 (2)
<b>Total</b>	<b>148 (100%)</b>	<b>244 (100%)</b>	<b>392 (100%)</b>

# Etiology of TDI

Frequency of causes (in percent) of traumatic dental injuries. The variables presented follow WHO nomenclature.

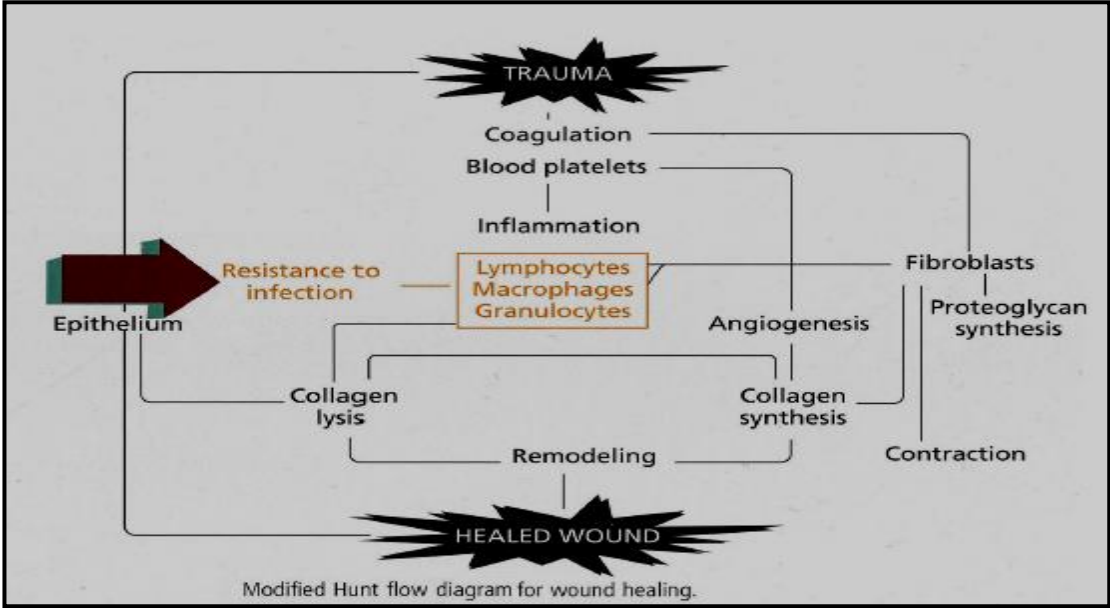
Study	Year	Country	Age	Physical leisure activity	Collision	Fall	Sport	Traffic accident	Violence	Inappropriate use of teeth or biting hard item	Other	Unknown
Baghdady et al. (166)	1981	Iraq	6–12	–	–	54.0	3.0	2.4	35.8	–	–	4.9
Baghdady et al. (166)	1981	Sudan	6–12	–	–	18.3	3.3	2.8	70.6	–	–	5.0
García Godoy et al. (383)	1981	Dominican Republic	7–14	–	1.7	50.0	–	5.1	–	–	10.2	32.4
García Godoy et al. (384)*	1984	Dominican Republic	5–14	36.6	–	–	49.4	14.0	–	–	–	–
Uji & Teramoto (385)*	1988	Japan	6–18	–	–	37.7	29.2	1.6	7.9	–	23.6	–
Chen et al. (220)	1999	Central Taiwan	Mean 8.2	–	65.3	26.9	3.6	–	2.6	–	1.6	–
Marcenes et al. (215)	1999	Syria	9–12	–	16.0	9.1	–	24.1	42.5	–	3.4	4.6
Blinkhorn (264)*	2000	UK	11–14	18.5	–	33.9	17.2	14.6	4.3	–	–	11.5
Marcenes et al. (244)	2000	Brazil	12	–	6.8	26.0	19.2	20.6	16.4	–	9.6	1.4
Nicolau et al. (269)*	2001	Brazil	13	–	15.0	24.1	2.3	10.5	1.5	6.0	–	40.6
Traebert et al. (233)	2003	Brazil	12	–	37.5	47.9	–	2.1	–	2.1	–	10.4

\* Population.

# Pathophysiology of trauma

Regeneration

Repaire/Scar



## Pathophysiology of trauma continued...

- Damage to gingival attachment and force bacteria
- Contusion of pd lig and bone
- Damage to Hertwig epithelial root sheath



## Clinical presentation

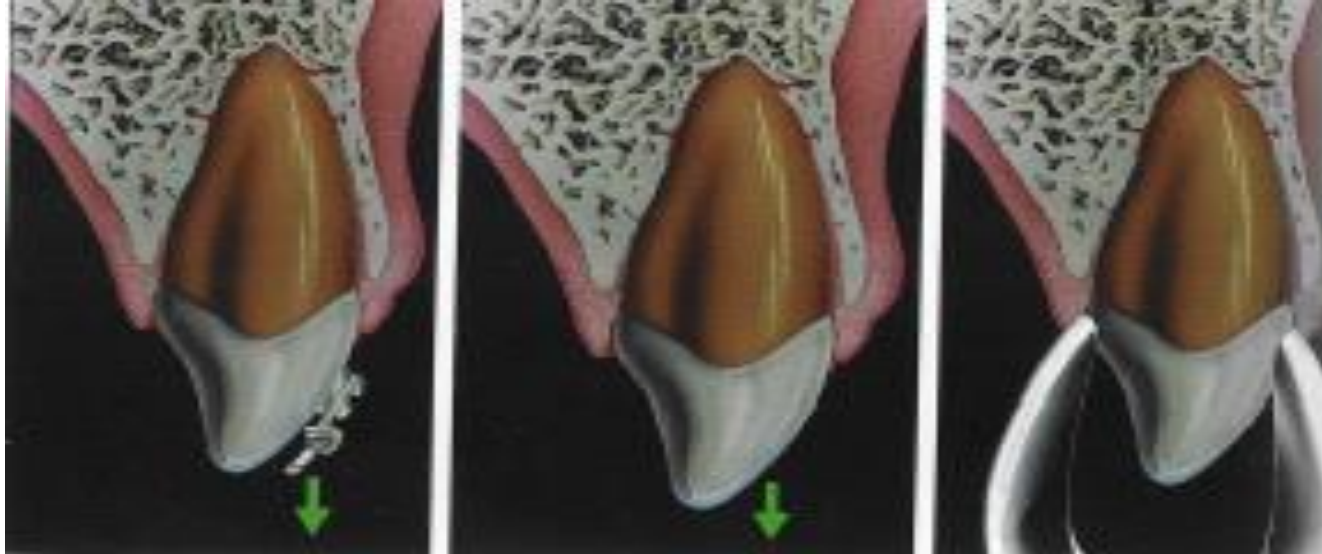
- Axial tooth displacement into socket.
- Immobile tooth and percussion may reveal ankylosis sound.
- Sensibility test most likely to be negative.

## Radiographic presentation

- Pd ligament space may be absent from all or part of the root.
- The cemento-enamel junction of the affected tooth is higher than that of the adjacent non affected teeth and sometimes higher than marginal bone.



# Management of Intrusive luxation



# Management

✓ MH

✓ DH

✓ Trauma history (2WH)

✓ Clinical examination (soft tissue, hard tissue exam)

✓ Radiograph

## Management continued...

### Closed apex teeth

- <3mm allow to erupt, if not moved within 2-4 weeks start orthodontic traction or surgical reposition before ankylosis develop; Root canal therapy within 2-3 weeks.



# Management continued...

## Closed apex teeth

- 3-7mm reposition surgically or orthodontically and splint for 4 weeks; Root canal therapy within 2-3 weeks.



# Management continued...

## Closed apex teeth

- >7mm reposition surgically and splint for 4 weeks ; Root canal therapy within 2-3 weeks.



# Management continued...

## Open apex teeth

- >7mm reposition (surgically or orthodontically and splint for 4 weeks).
- Otherwise allow to re-erupt spontaneously.

### NB.

If signs and symptoms of inflammatory resorption appears start RCT.



# Management continued...

## Follow up

- ✓ 2 weeks, Clinical and radiographic exam.
- ✓ 4 weeks, Clinical and radiographic exam., splint removal.
- ✓ 6-8 weeks, Clinical and radiographic exam.
  
- ✓ 6 months, Clinical and radiographic exam
- ✓ 1 year, Clinical and radiographic exam
- ✓ Yearly for 5 years, Clinical and radiographic exam.

# Outcomes of intrusive luxation

## **Favorable outcomes**

- Tooth is erupting or return to place.
- No signs of resorption.
- Intact lamina dura.
- Continued root development in immature teeth.

## **Unfavorable outcomes**

- Tooth become locked/ankylosed.
- Radiographic signs of apical periodontitis.
- External inflammatory resorption or replacement resorption.
- Endodontic treatment according to stage of root development.



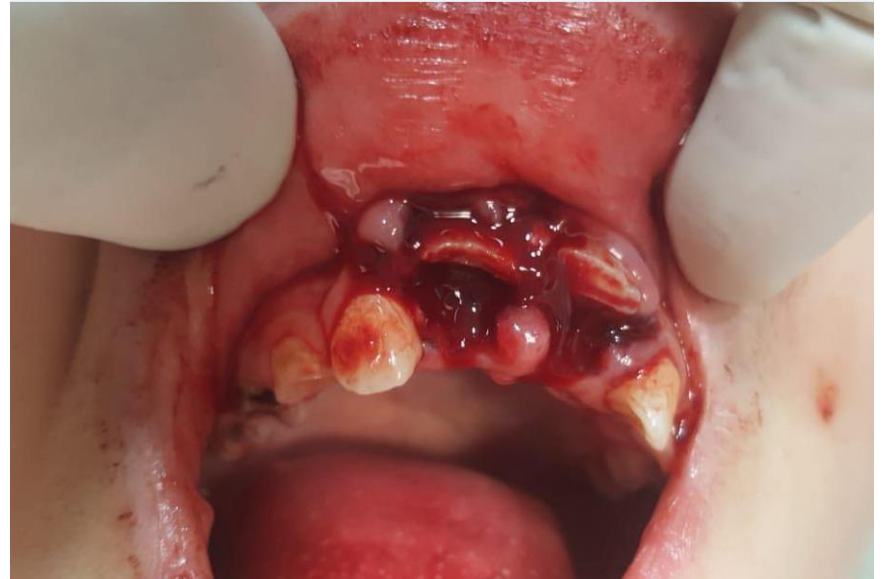
# Clinical case scenario

A 10 yrs old male attend to dental clinic referred from a colleague dentist, the child has trauma as he slipped from a slide in water park at Al -Jazera one day earlier.

Before  
trauma



At day of trauma



# Management

➤ **Medical history:** (As reported by parents) pre-term born child has some problem with left eye movement; no otherwise reported medical condition.

- **Allergy to penicillin:** nil.

- **Vaccination status for tetany:** unknown.

➤ **Past dental history:** the patient had some dental treatment done under local anesthesia.

➤ **Trauma history:**

**When:** 25/6/2019

**Where:** at Al Jazera water park/ Baghdad/Iraq.

**How:** slipping over slide in Water Park.

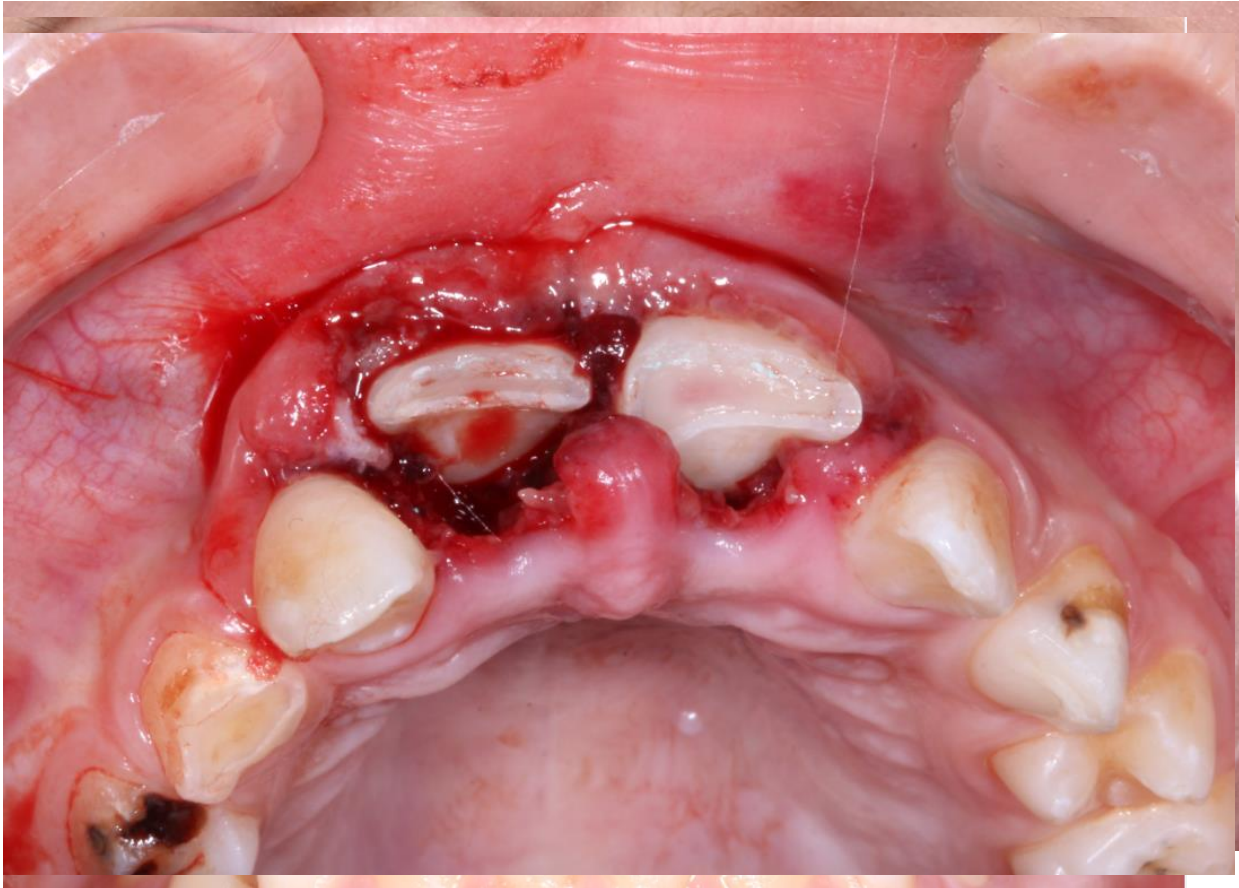
➤ **1st emergency treatment received:** child seen at private dental clinic / 11 pm/ the dentist took periapical radiograph for upper permanent central incisors and tried to reduce socket fracture under local anesthesia.

➤ **Day two:** child attend with parents to [REDACTED] on 26/6/2019; 4 pm the child was conscious.

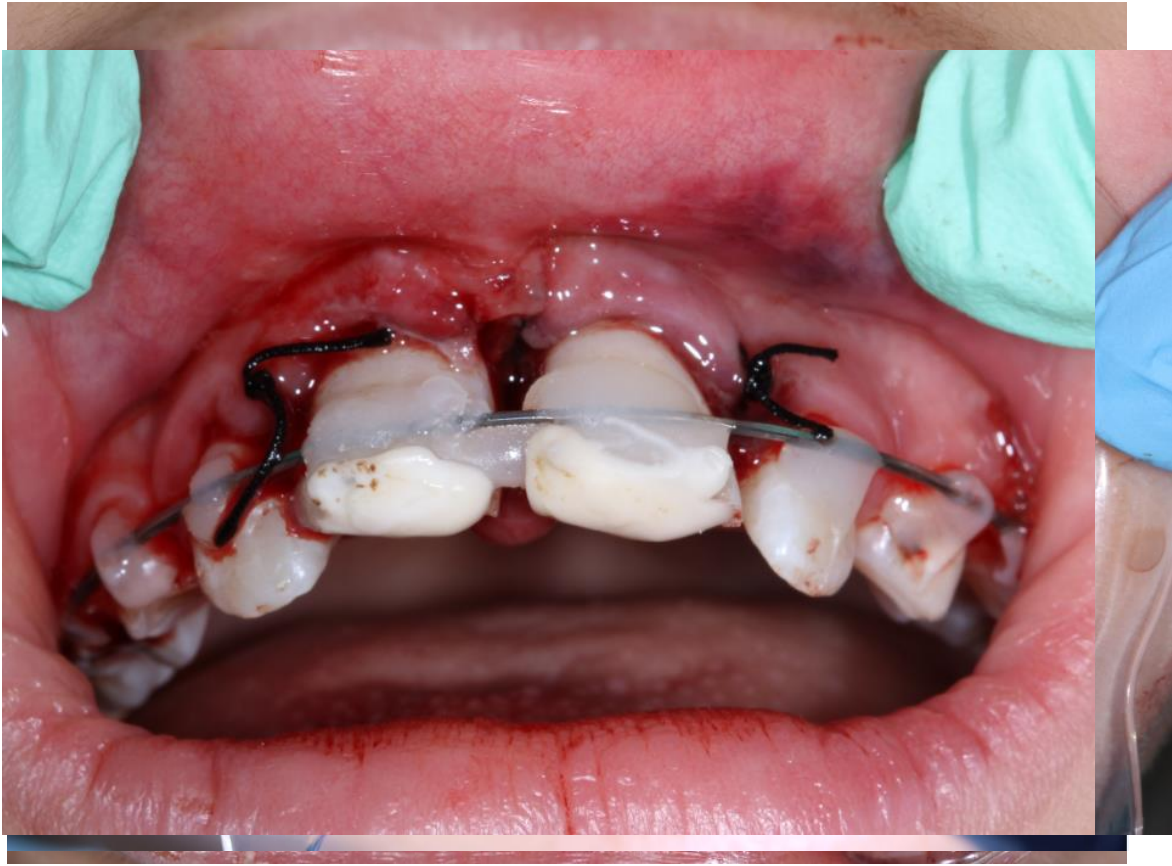
➤ **Extra oral examination revealed:** slight abrasion of skin around lip and slight nasal septal deviation to the left side of face and the child reported blocked left nostril.

➤ **Intra oral examination:** revealed complete intrusion (confirmed also by radiograph) of upper permanent central incisors with incisal edge fractures and fractured cortical plate (anterior

# Day two







One week later



# Follow Up

Visit	Date	Treatment
1st	26.6. 2019	Reposition with forceps LI → ambled, excessive II normally to both
2nd	3.7. 2019	Great palate reduction. splinting, LI fused Bandage of GTC for Both, Sildenafil gum
3rd	28.8. 2019	Sulva Removal EPT + other top done PA taken in changes Bone & <del>CLL</del> splint removal (2 months) GI Bandage on LI lost P with exposed dentine Suggest P. No. 335. → Bandage removed clean # edge (Composite) Bandage placed on Incisal edge & Post-pand restoration to verify vitality?!
4th	19.2. 2020 (2.5.2020) splint from filling	LI internal foramina RCT/1 < 3 to 4 mm eye located under bandage at 14 mm, Q100% infected to be seen in 4 months



26.6.2019

	21	22	23	24
Color	N	N	N	N
Activity	2	intended	intended	2
TTP	+ve	-ve	+ve	+ve
Cell Tol (EC)	NA	NA	NA	NA
EPT	NA	NA	NA	NA
Radiogly	open	open	open	open

3.7.2019

	21	22	23	24
Color	N	N	N	N
Activity	NA	NA	NA	NA
TTP	+ve	-ve	-ve	+ve
EC	+ve	-ve	-ve	+ve
EPT				
Radiogly	open	open	open	open

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28.8.2019

	21	22	23	24
Color	N	intended	intended	N
Activity	1	1	1	1
TTP	-ve	-ve	-ve	+ve
EC	+ve	-ve	-ve	+ve
EPT	17	42	44	-ve
Radiogly	open	open	open	open

NA previous round of 4th is still under to compare with

19.2.2020

	21	22	23	24
Color	N	4	4	N
Activity	1	1	1	1
TTP	-ve	-ve	-ve	-ve
EC	+ve	-ve	-ve	-ve
EPT	+ve	-ve	-ve	-ve
Radiogly	open	open	open	open



## To summarize

1. Intrusive luxation has poor prognosis in terms of pulpal survival, pd and marginal bone loss in 5 years period.
2. For closed apex teeth start RCT within 2 weeks.
3. If ortho or surgical reposition is used then splint for 4 weeks.
4. If tooth not moved spontaneously within 2-4 weeks start option 3.
5. Intruded immature teeth(>7) start option 3 otherwise wait.
6. Multiple intrusion with boney fractures use surgical reposition.

Any questions?

