

Akutbehandling

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Trauma akutbehandling

- ⇒ Kunskap
- ⇒ Reducera stress och oro
- ⇒ Reducera smärta

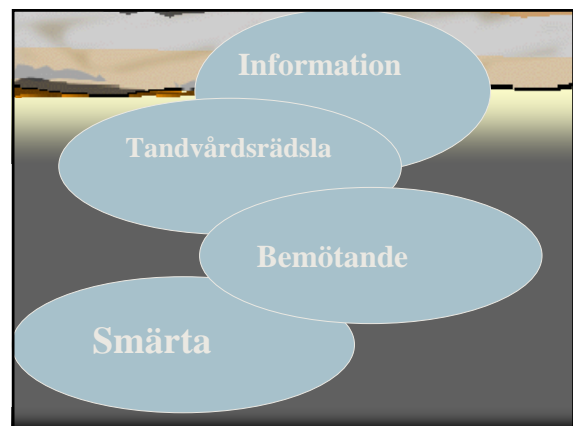
Trauma akutbehandling

- ⇒ Kunskap
- ⇒ Omhändertagande

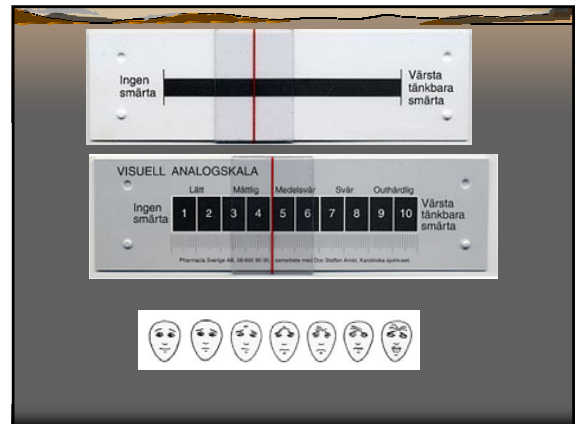
Trauma akutbehandling

- ⇒ Riskbedömning

Robertson A and Norén JG
Subjective aspects of patients with
traumatized teeth.
Acta Odontol Scand 1997;55:142-147



Smärt- skattning



⇒ Upplevelser och erfarenhet av vardags- och tandvårdsrelaterad smärta hos barn

⇒ Attityd och kunskap om smärta hos tandvårdspersonal

Krekmanova och Robertson

Vilka barn skadar sina tänder?

Odoi R, Croucher R, Wong F, Marcenes W.

The relationship between problem behaviour and traumatic dental injury amongst children aged 7-15 years old.

Community Dent Oral Epidemiol 2002, 30:392-396

⇒ SDQ

(Strengths and Difficulties Questionnaire)

Conclusion:

Problem behaviour may play an important role in the occurrence of traumatic dental injury

Sabuncuoglu O, Taser H, Berkem M

Relationship between traumatic dental injuries and attention-deficit/hyperactivity disorder in children and adolescents: proposal of an explanatory model.

Dent Traumatol. 2005;21(5):249-53

475 barn
8-17 år

The present study suggests that ADHD in children is a predisposing factor for traumatic dental injuries.

DIAGNOS

Okomplicerad kronfraktur

Review article

Olsburgh S, Jacoby T, Krejci.
Crown fractures in the permanent dentition: pulpal and restorative considerations

Dent Traumatol 2002;18:103-115

If handled properly, **prognosis of the pulp**, after traumatic crown fracture, is good. **Prognosis of the restoration** has also improved considerably over the last few years, and it appears that this trend will continue in the future.

Olsburgh 2002

Pulpa

⇒ Passiv mekanism

⇒ Aktiv mekanism

Robertson A, Andreasen FM,
Andreasen JO and Norén JG

Long-term prognosis of crown fractured
permanent incisors.
The effect of stage of root development
and associated luxation injury

International Journal of Paediatric
Dentistry
2000;10:191-199

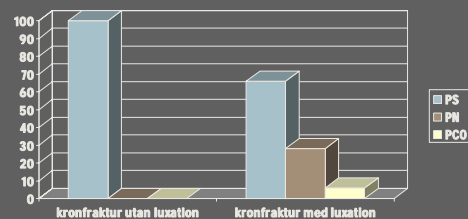
4 grupper

- ⇒ Kronfraktur utan pulpablotta / ingen luxation
- ⇒ Kronfraktur utan pulpablotta / med luxation
- ⇒ Kronfraktur med pulpablotta / ingen luxation
- ⇒ Kronfraktur med pulpablotta / med luxation

455 kronfrakturer

- ⇒ 352 kronfrakturer utan pulpablotta
- ⇒ 103 kronfrakturer med pulpablotta

PS / PN / PCO



Andreasen JO, Andreasen FM,
Skeie A Hjorting-Hansen E,
Schwartz O.

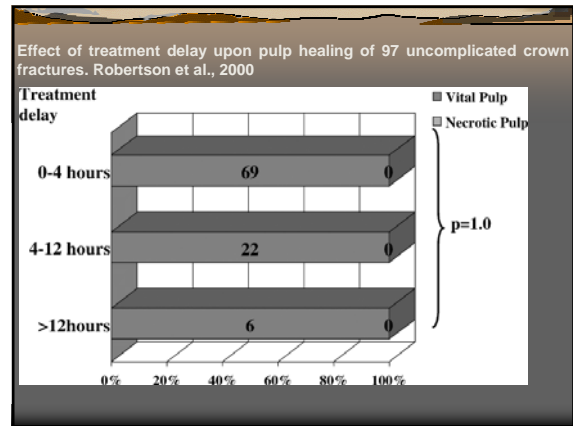
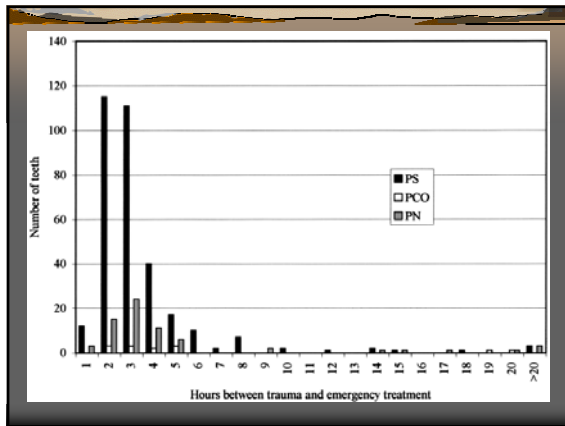
Effect of treatment delay upon
pulp and periodontal healing of
traumatic dental injuries -- a
review article

Dent Traumatol. 2002
Jun;18(3):116-28.

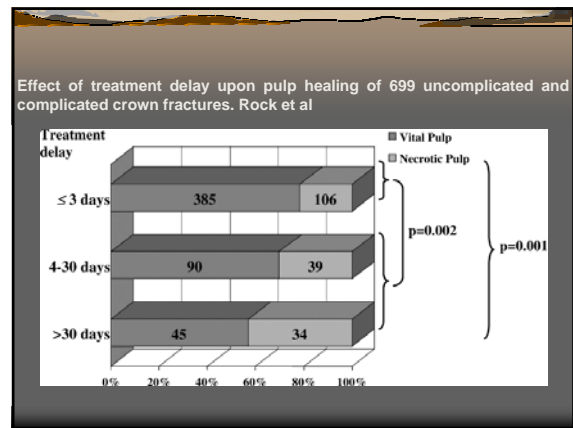
Robertson, A., Andreasen, F.M.,
Andreasen, J.O. & Norén, J.G.

Long-term prognosis of crown-
fractured permanent incisors. The
effect of stage of root development
and associated luxation injury.

International Journal of Paediatric
Dentistry 10 (3), 191-199.



Rock WP, Gordon PH, Friend LA, Grundy MC.
The relationship between trauma and pulp death in incisor teeth.
Br Dent J 1974;136:236-9.



Restorationen

- ⇒ Bonding
- ⇒ Material

Robertson A, Robertson S, Norén JG.
A retrospective evaluation of traumatized permanent teeth.
Int J Paediatr Dent. 1997;7(4):217-26.

198 patienter

- ⇒ 250 kronfrakturer
- ⇒ 15 års uppföljning
- ⇒ 19 % 10 ggr omgörning
- ⇒ 25% otillfredställande

Robertson 1997

Andreasen FM, Norén JG, Andreasen JO, Engelhardtisen S, Lindh-Strömberg U.

Long-term survival of fragment bonding in the treatment of fractured crowns: a multicenter clinical study.

Quintessence Int 1995;26:660-81

334 permanenta incisiver

Grupp 1
25 % kvar 7.5 år

Grupp 2
25 % kvar 6.5 år

The **good fragment retention**, **acceptable esthetics**, and **pulpal vitality** observed in the present series indicate that reattachment of the coronal fragment is a realistic alternative to placement of conventional resin-composite restorations.

Andreasen FM 1995

Farik B, Munksgaard EC.

Fracture strength of intact and fragment-bonded teeth at various velocities of the applied force.

Eur J Oral Sci 1999; 107:70-3

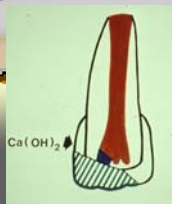
to investigate the resistance to fracture of bovine incisors re-attached with no preparation or with a bevel using five adhesive materials:

- ⇒ Vad gör vi sedan?
- ⇒ När?
- ⇒ Vem?

- ⇒ Försäkringstagaren skadade sina framtänder vid en olyckshändelse.
- ⇒ Önskemål om kronterapi har framförts. Beh tdl har skjutit på beh. Man har inte velat utföra porslinsersättningar före 20 år.
- ⇒ FTV har inte följt de regler och den lagstiftning som finns. FTV har behandlingsansvar inkl protetik tom 19 år. Kronor skulle ha utförts före 20 år. Det fanns inga odontologiska skäl att skjuta på behandlingen. FTV har inte utfört nödvändig behandling.

KOMPLICERAD KRONFRAKTUR

- ⇒ Bakterier
- ⇒ Inflammation
- ⇒ Pulpal läkning
- ⇒ Hårdvävnadsbildning



Cvek M

A clinical report on partial pulpotomy and capping with calcium hydroxide in permanent incisors with complicated crown fracture.

J Endod. 1978 Aug;4(8):232-7.

Material

- ⇒ Calcium hydroxid
- ⇒ Adhesiva system
- ⇒ MTA (mineral trioxide aggregate)

Calcium hydroxid

Adhesiva system

- ⇒ B. Oguntebi, A. Clark and J. Wilson, Pulp capping with Bioglass and autologous demineralized dentin in miniature swine, *J Dent Res* 72 (1993), pp. 484–489.
- ⇒ N. Onoe, Study on adhesive bonding systems as a direct pulp capping agent, *Japan J Conserv Dent* 37 (1994), pp. 429–466.
- ⇒ Y. Kitasako, S. Inokoshi and J. Tagami, Effects of direct resin pulp capping techniques on short-term response of mechanically exposed pulps, *J Dent* 27 (1999), pp. 257–263.
- ⇒ N. Akimoto, Y. Momoi, A. Kohno, S. Suzuki, M. Otsuki, S. Suzuki and C.F. Cox, Biocompatibility of Clearfil Liner Bond 2 and Clearfil AP-X system on nonexposed and exposed primate teeth, *Quintessence Int* 29 (1998), pp. 177–188.

- ⇒ J. Hebling, E.M. Giro and C.A. Costa, Biocompatibility of an adhesive system applied to exposed human dental pulp, *J Endod* 25 (1991), pp. 676–682.
- ⇒ J.C. Pereira, A.D. Segala and C.A. Costa, Human pulpal response to direct pulp capping with an adhesive system, *Am J Dent* 13 (2000), pp. 139–147.
- ⇒ P. Hörsted-Bindslev, V. Vilkinis and A. Sidlauskas, Direct capping of human pulps with a dentin bonding system or with calcium hydroxide cement, *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 96 (2003), pp. 591–600.

MTA

M. Torabinejad, T.F. Watson and T.R. Pitt Ford,
Sealing ability of a mineral trioxide aggregate when used as a root end filling material,
J Endod 19 (1993), pp. 591–595.

M. Torabinejad and N. Chivian,
Clinical applications of mineral trioxide aggregate,
J Endod 25 (1999), pp. 197–205.

T.R. PittFord, M. Torabinejad, H.R. Abedi, L.K.
Backland and S.P. Kariyawasam,
Using mineral trioxide aggregate as a pulp capping
material,
J Am Dent Assoc 127 (1996), pp. 491–494.

MTA

- ⇒ Högt ph
- ⇒ Stelnar i fuktig miljö
- ⇒ Hård stelmande

Bergenholtz G.

Advances since the paper by Zander and Glass (1949) on
the pursuit of healing methods for pulpal exposures:
historical perspectives.

Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2005
Aug;100(2 Suppl):S102-8.

Bergenholtz G, Spangberg L. CONTROVERSIES IN ENDODONTICS.

Crit Rev Oral Biol Med. 2004;15(2):99-114.

Riskbedömning

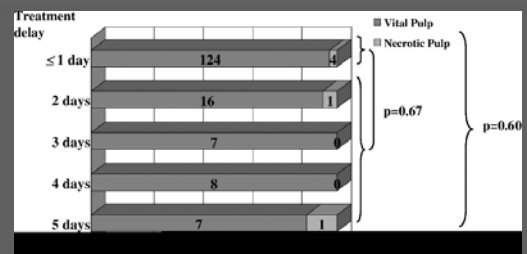
- ⇒ Delay
- ⇒ Pulpans kondition före trauma
- ⇒ Storlek
- ⇒ Ålder
- ⇒ Luxations skador
- ⇒ Rotutvecklingsstadium

Cvek M.

Partial pulpotomy in crown-
fractured incisors – results 3–15
years after treatment.

Acta Stomatol Croat 1983;27:167–
73.

Effect of treatment delay upon pulp healing of 169 complicated crown fractured
teeth treated by partial pulpotomy.



Cvek 1983

Pulpans kondition före trauma

Baume LJ, Holz J.
Long term clinical assessment of
direct pulp capping.
Int Dent J. 1981 Dec;31(4):251-60.

Storlek

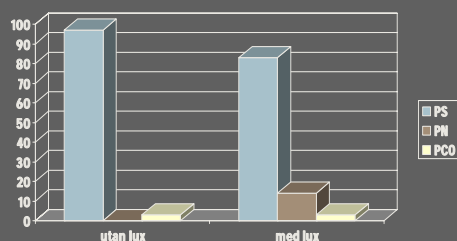
Luxations skador Rotutvecklingsstadium

Robertson A, Andreasen FM,
Andreasen JO and Norén JG
Long-term prognosis of crown fractured permanent
incisors.
The effect of stage of root development and
associated luxation injury
International Journal of Paediatric Dentistry
2000;10:191-199

455 kronfrakturer

- ⇒ 352 kronfrakturer utan pulpablotta
- ⇒ 103 kronfrakturer med pulpablotta

PS / PN / PCO



Akutbehandling av kronfrakturer

- ⇒ Preoperativ smärtlindring
- ⇒ Injektion
- ⇒ Behandla dentinsår och pulpasår
- ⇒ Postoperativ smärtlindring

ROTFRAKTUR

Miomir Cvek, Jens O. Andreasen, Mette K. Borum.

Healing of 208 intraalveolar root fractures in patients aged 7–17 years

Dent Traumatol 2001;17:53-62

J. O. Andreasen, F. M. Andreasen, I. Mejäre, M. Cvek

Healing of 400 intra-alveolar root fractures.
1. Effect of pre-injury and injury factors such as sex, age, stage of root development, fracture type, location of fracture and severity of dislocation.

Dent Traumatol 2004;20:192-202

J. O. Andreasen, F. M. Andreasen, I. Mejäre, M. Cvek

Healing of 400 intra-alveolar root fractures.
2. Effect of treatment factors such as treatment delay, repositioning, splinting type and period and antibiotics.

Dent Traumatol 2004;20:203-211

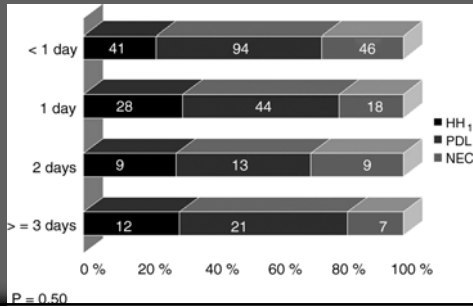
Rotfrakturer

- ⇒ Rotutveckling
- ⇒ Frakturtyp
- ⇒ Lokalisation
- ⇒ Dislokation
- ⇒ Kronfraktur

Rotfrakturer

- ⇒ Delay
- ⇒ Reponering
- ⇒ Fixering
- ⇒ Fixeringstyp
- ⇒ Fixeringstid
- ⇒ Antibiotika

Treatment delay



Reposition

⇒ Diastas

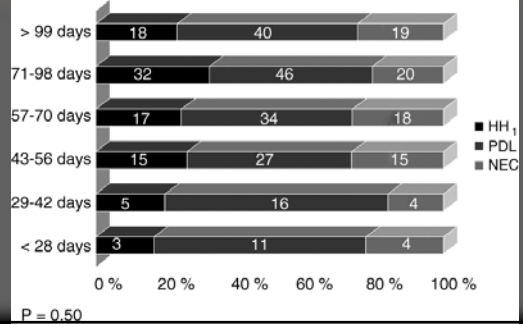
■ 0.1-2.1mm (4 grupper)

⇒ Optimal eller Ej optimal

Fixering

	NEC	Orthodontic bands + arch	Cap splint	Composite	Composite + arch bar
Cap splint		0.82			
Composite		0.41	0.25		
Composite + arch bar		0.21	0.03	1.0	
Kevlar®/fiber glass		0.15	0.06	0.03	0.002

Duration



ANTIBIOTIKA

⇒ 387 ej antibiotika

⇒ 13 antibiotika

Rot fraktur

⇒ Cervical 1/3

⇒ Mellersta 1/3

⇒ Apikala 1/3

Rot fraktur apikala 1/3

⇒ Dislokation

⇒ Mobilitet

Rot fraktur mellersta 1/3 och cervikala 1/3

Behandling

Preoperativ smärtlindring

Injektion

Reponering

Fixering

Postoperativ smärtlindring

Extrusion/Lateral luxation

⇒ Rotutveckling

⇒ Status/Diagnos

⇒ Reposition

⇒ Delay

Lee R, Barrett EJ, Kenny DJ.

Clinical outcomes for permanent incisor luxations in a pediatric population. II. Extrusions.

Dent Traumatol. 2003 Oct;19(5):274-9.

Humphreys K, Al Badri S, Kinirons M, Welbury RR, Cole BO, Bryan RA, Campbell O, Fung DE.

Factors affecting outcomes of traumatically extruded permanent teeth in children.

Pediatr Dent. 2003 Sep-Oct;25(5):475-8.

Nikoui M, Kenny DJ, Barrett EJ.

Clinical outcomes for permanent incisor luxations in a pediatric population. III. Lateral luxations.

Dent Traumatol. 2003 Oct;19(5):280-5.

⇒ 55 incisiver

⇒ 10.6 år

Although not statistically significant, a trend towards increased PN was found with more **severely extruded** teeth

Lee R 2005

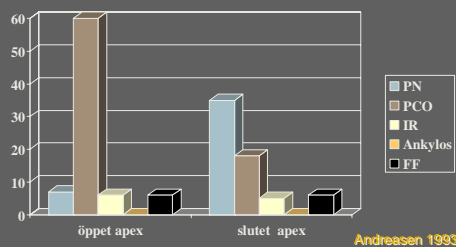
72 tänder

10.1 år

Residual extrusion could be minimized by **earlier presentation and repositioning**. The risk of pulpal necrosis is greatest for **severely extruded** teeth and for those with **closed apices**.

Humphreys K 2003

Komplikationer- extrusionsluxation



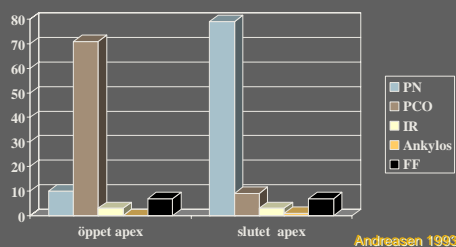
⇒ 58 incisiver

⇒ 11.4 år

root development and extent of lateral luxation were not significantly related to PN and PCO.

Nikoui M 2003

Komplikationer- lateral luxation

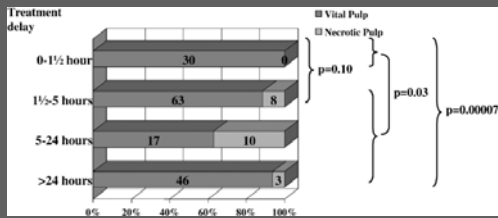


Andreasen JO, Andreasen FM, Skeie A, Hjorting-Hansen E, Schwartz O.

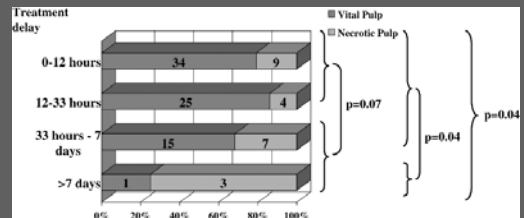
Effect of treatment delay upon pulp and periodontal healing of traumatic dental injuries -- a review article.

Dent Traumatol. 2002 Jun;18(3):116-28.

Effect of treatment delay upon pulp healing of 189 luxated teeth. Andreasen, 1970



Effect of treatment delay upon healing of 98 luxated teeth with dislocation. Eklund 1976



Intrusionsluxation

Intrusionsluxation

1,9 %

Intrusionsluxation

Andreasen JO, Bakland LK, Matras RC, Andreasen FM.

Traumatic intrusion of permanent teeth. Part 1.

An epidemiological study of 216 intruded permanent teeth.

Dent Traumatol. 2006 Apr;22(2):83-9.

Intrusionsluxation

Andreasen JO, Bakland LK, Andreasen FM.

Traumatic intrusion of permanent teeth.

Part 2.

A clinical study of the effect of preinjury and injury factors, such as sex, age, stage of root development, tooth location, and extent of injury including number of intruded teeth on 140 intruded permanent teeth.

Dent Traumatol. 2006 Apr;22(2):90-8.

Intrusionsluxation

Andreasen JO, Bakland LK, Andreasen FM
Traumatic intrusion of permanent teeth
Part 3.

A clinical study of the effect of treatment variables such as treatment delay, method of repositioning, type of splint, length of splinting and antibiotics on 140 teeth.
Dent Traumatol. 2006 Apr;22(2):99-111.

Författare, år	n
Andreasen, 1970	23
Andreasen & Vestergaard Pedersen, 1985	61
Jacobsen, 1983, 1991	40
Kinirons & Sutcliffe, 1991	29
Ebeleseder et al., 2000	58
Al-Badri et al., 2002	61
Humphrey et al., 2003	31
Chaushu et al., 2004	31
Andreasen et al., 2004	140

Komplikationer

- ⇒ Olyckstillfället
- ⇒ Behandlingen

Olyckstillfället

- Rotutveckling
- Kronfraktur
- Förflyttning
- Antal tänder

Rotutveckling

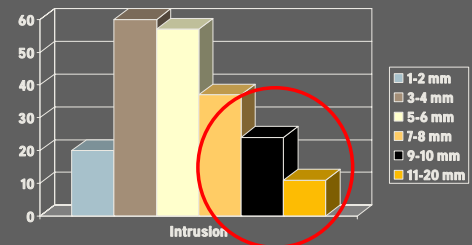
- ⇒ 1. ¼ rotformation
- ⇒ 2. ½ rotformation
- ⇒ 3. ¾ rotformation
- ⇒ 4. Full rotlängd, öppet apex
- ⇒ 5. Full rotlängd, halvslutet apex
- ⇒ 6. Full rotlängd, slutet apex

Age (year)	PS	PN
06–11	16 (22)	57 (78)
12–17	0 (0)	30 (100)
>17	0 (0)	37 (100)
Root development (stage)		
2	0 (0)	5 (100)
3	4 (33)	8 (67)
4	10 (38)	16 (62)
5	1 (17)	5 (83)
6	1 (1)	90 (99)

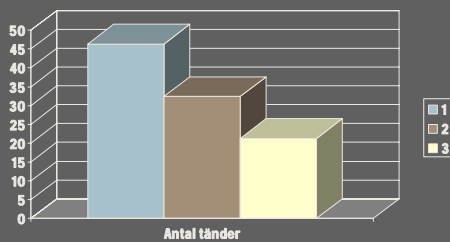
Intrusionsluxation

⇒ Kron/rot fraktur 60.5%

Intrusionsluxation



Intrusionsluxation



Behandlingen

- ⇒ Reponering
- ⇒ Fixering
- ⇒ Fixeringstid
- ⇒ Antibiotika

Reponering

- ⇒ Spontan reeruption
- ⇒ Kirurgisk reponering
- ⇒ Ortodontisk reponering

Spontan reeruption

Kirurgisk reponering

Ortodontisk reponering

Ortodontisk reponering

Fixering

Repositioning method	PN		RR		MA				
None	9 (24)	29 (76)	0.02	25 (66)	13 (34)	0.02	8 (100)	0 (0)	0.001
Surgical complete	3 (5)	58 (95)		30 (49)	31 (51)		31 (51)	30 (49)	
Surgical incomplete	2 (17)	10 (83)		2 (17)	10 (83)		6 (50)	6 (50)	
Orthodontic	2 (7)	27 (93)		16 (55)	13 (45)		20 (69)	9 (31)	

Fixering

	PN		RR		MA				
Flexible	1 (10)	9 (90)	0.96	5 (50)	5 (50)	0.54	4 (40)	6 (60)	0.07
Semirigid	7 (8)	80 (92)		39 (45)	48 (55)		57 (66)	30 (34)	
Rigid	1 (7)	14 (93)		9 (60)	6 (40)		6 (40)	9 (60)	

Fixeringstid

	PN		RR		MA				
7-28	1 (7)	13 (93)	0.58	8 (57)	6 (43)	0.69	6 (34)	8 (57)	0.75
29-42	2 (10)	18 (90)		8 (42)	11 (58)		9 (45)	11 (55)	
43-119	1 (3)	31 (97)		16 (49)	17 (51)		17 (53)	15 (47)	

Antibiotika

	PN			RR			MA		
No	11 (11)	86 (89)	0.58	54 (56)	43 (44)	0.14	70 (72)	27 (28)	0.08
Yes	5 (12)	38 (88)		19 (44)	24 (56)		25 (58)	18 (42)	

Konklusion

⇒ Öppet apex

- Spontan reeruption
- >7 mm

Spontan reeruption, Ortodontisk, Kirurgisk

⇒ Slutet apex 12-17 år

- Spontan reeruption
 - >7 mm Spontan reeruption, Ortodontisk, Kirurgisk
- >17 år
 - Kirurgisk, Ortodontisk

INTRUSIONSLUXATION

Slutet apex

Profylaktisk
endodonti

Konklusion

⇒ Slutet apex

- Total intrusion
- Multipla intrusioner, spec med labial displacering
 - Kirurgisk reposition

- Penetration av näskaviteten
 - Kirurgisk reposition

Kenny DJ, Barrett EJ, Casas MJ
Avulsions and intrusions: the
controversial displacement
injuries.

J Can Dent Assoc 2003;69:308-
13

Intrusion

Mild < 3 mm Passive repositioning

Moderate 3-6 mm Passive repositioning
Active repositioning

Severe > 6 mm Extraction
Immediate repositioning

Fixering

Fixeringstid

- ⇒ 7-10 dagar
- ⇒ 2-3 veckor
- ⇒ 4 veckor eller längre
- ⇒ 4 veckor
- ⇒ 2-3 månader

