Tough Choice for Young First Permanent molars: To Do Pulp Treatment or to Extract?

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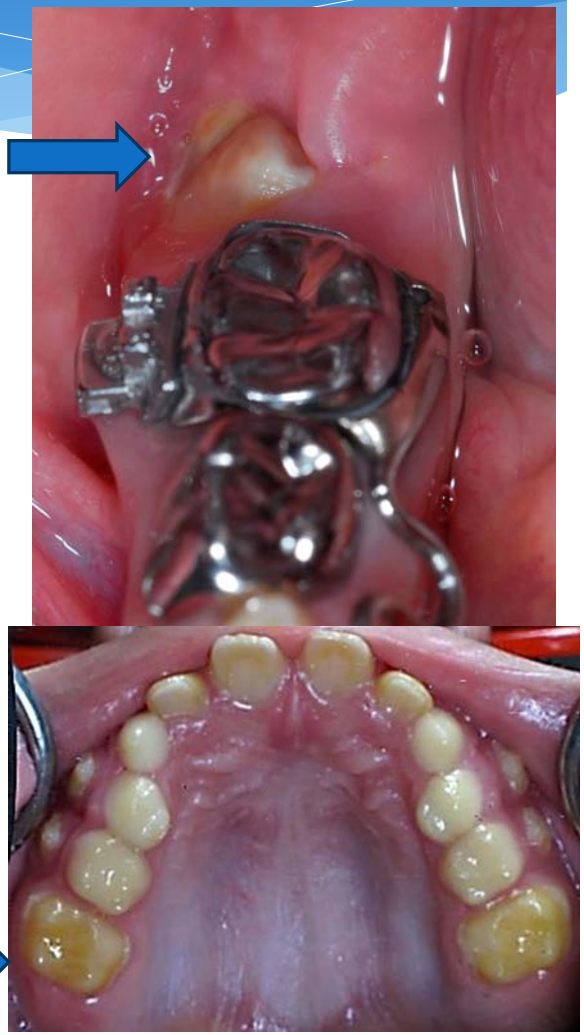
Introduction

* The first permanent molar (FPM) has a very high caries rate.
* In the United States (1980s) 50–60% of the FPM occlusal surfaces were decayed or restored by the age of 11–12 years
* In China the DMFT of FPMs was as high as 41% (2008)
* In Brazil is about 40% ,
* in the United Kingdom it is 45–48%

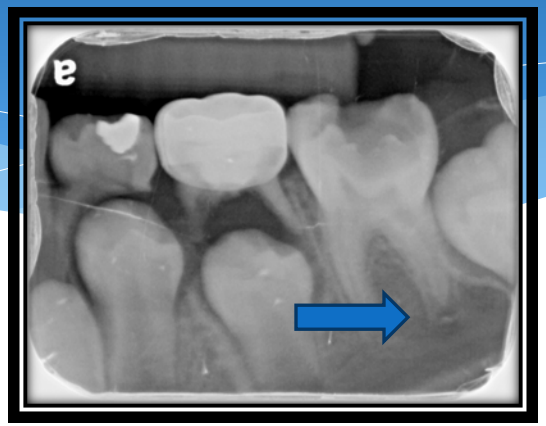
Enamel hypomineralization

* The exact cause of molar hypomineralization is unclear
* Most studies only rely on parental recall of medical and dental problems in the first three years of life.
* The prevalence rate of molar and/or incisor hypomineralization has been reported to be between 4 -25%.
* Susceptible to deep occlusal decay that may lead to irreversible pulpitis



What would you do?

-Deep Caries
-Young age
-Pain
-Acute pulpitis
-Poor prognosis



Refer to Endo and see you later…

AAPD Guideline

* When the infectious process cannot be arrested
* bony support cannot be regained
* inadequate tooth structure remains for a restoration
* excessive pathologic root resorption exists

* **extraction should be considered.**

Ortho consideration

* very few definitive papers to guide the clinician when making the decision to extract or to endodontically treat a carious FPM
* “conservative” decisions are usually made—Endo
* extract young permanent teeth must include a plan to close the space created by the extraction
* most orthodontists shy away from treatment plans that involve FPM extractions

Review of Literature

Clinical and Case Studies		
Jälevik B and Möller M, 2007[9]	27 children (5.6-12.7 yrs old)	1) Good spontaneous space closure can be expected when extracting a FPM **prior to the eruption of the permanent second molar**.
Gill DS et al., 2001[10]	Several cases	1) The ideal time for the extraction of the FPM's (with poor prognosis) is **before the eruption of the second molars**. 2) This timing is most critical in the mandible. 3) Suggested contraindications.
Ong DC-V and Bleakley JE, 2010[11]	Several cases	1) Suggested indications. 2) Suggested contraindications. 3) FPM extraction and SPM substitution warrants consideration in any case where the long-term prognosis of a FPM is questionable.
Sandler Pet al., 2000[12]	Three cases	1) Suggested indications.

Third molar position

Ay S et al., 2006[14]	**107 patients with unilateral Md FPM extractions before age 16**	**1) Unilateral Md FPM extraction increases the space available for Md third molar eruption. 2) Unilateral Md FPM extraction may cause uncontrolled tipping of adjacent teeth**
Bayram M et al., 2009[15].	41 subjects (21 ext four FPM and 20 non ext). Mean age 16.6 years	1) FPM extraction with fixed orthodontic treatment increases the eruption spaces for third molars and decreases impaction. This effect is greatest in the maxillary (Mx) arch.
Yavuz I et al., 2006[16]	165 children with unilateral early FPM loss	1) Early loss of the FPMs might have an accelerating effect on the development of the third molar on the extraction side.

Midline and ortho consideration

Midline and Skeletal Effects		
Cağlaroğlu M et al., 2006[18]	51 subjects with unilateral early FPM loss	1) Unilateral FPM extractions caused dental midline deviations in both arches. Especially in the mandibular arch. 2) Unilateral FPM extractions can result in "remarkable" skeletal asymmetry.
With Orthodontics		
Daugaard-Jensen I, 1973[13]	22 orthodontic cases	1) Demonstrated that orthodontic treatment could be **successfully** accomplished with FPM extractions.

Ideal timing for extraction

- General recommendations
  - FPM should be extracted before eruption of the SPM
- Lower FPM
  - When there is radiographic evidence of dentine calcification in the lower SPM bifurcation
  - This is usually at 8-10 years of age (mid mix-dentition)
- Upper FPM
  - As long as the upper FPM is extracted before the upper SPM has erupted (i.e. by 12-13 years of age), the SPM will tend to move into a favorable occlusal position

http://www.maxfaxsho.co.uk/Extraction-of-first-molars

Indications for early FPM extraction

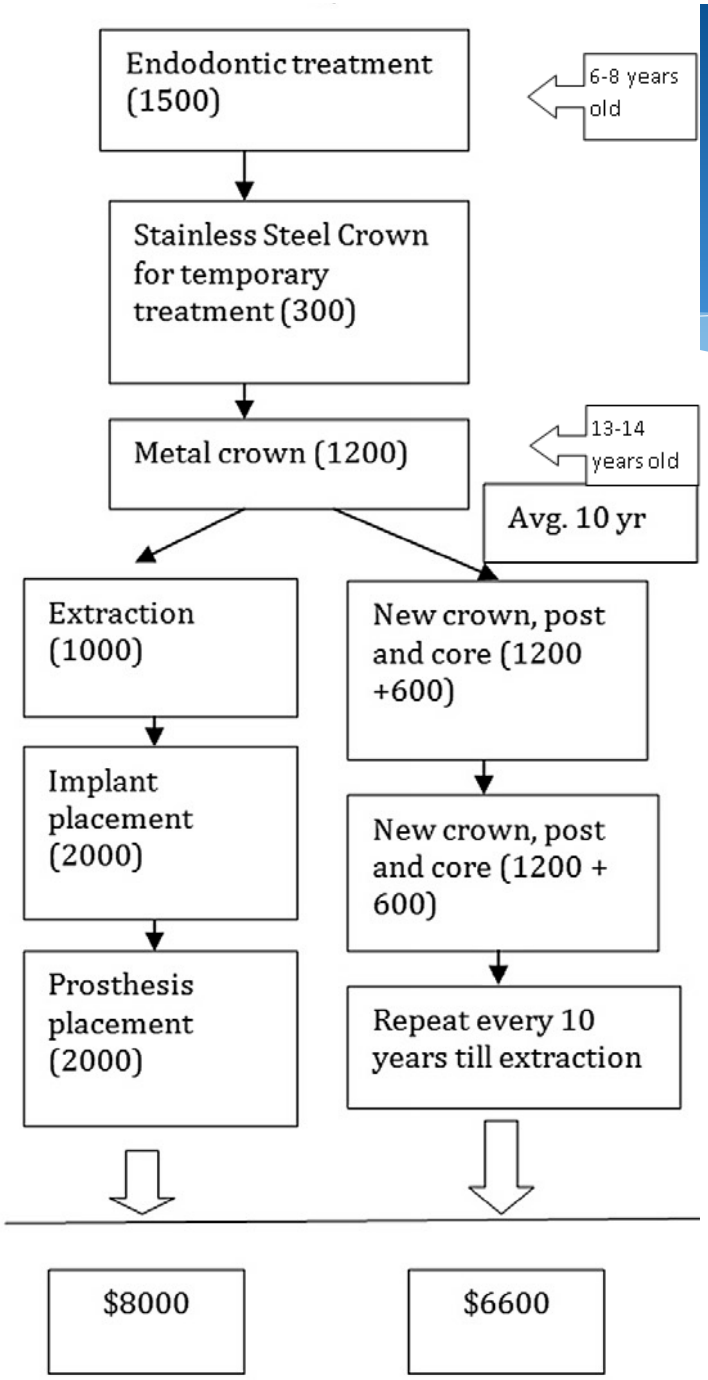
- Factors that favor FPM extraction:
  - Class I Occlusion
  - Premolar crowding
  - No missing permanent teeth
  - FPMs with poor treatment prognosis
  - Dental age of 9-11

Refernce: Chen JW, Leggitt VL. 2012. Pulp treatment for young first permanent molars: To treat or to extract? Endo Topics 23: 34-40.

Contraindications to early FPM extraction

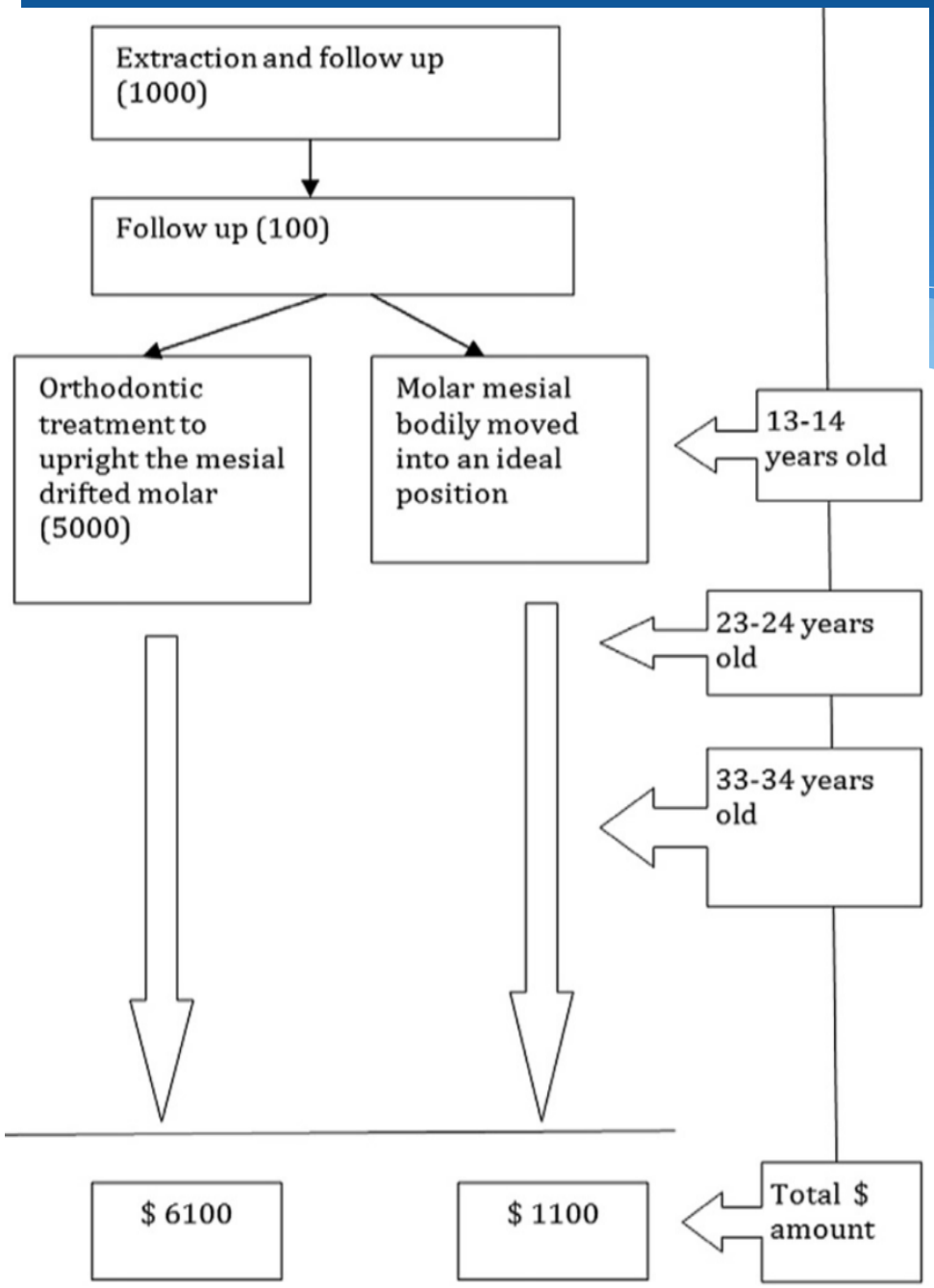
- Factors that may contraindicate extraction:
  - FPM in the a quadrant that contains another missing permanent tooth
  - Brachyfacial type
  - Deep bite
  - Positive Arch Length Discrepancy (Arch spacing)
  - Class III Malocclusion MX

Cost and benefit

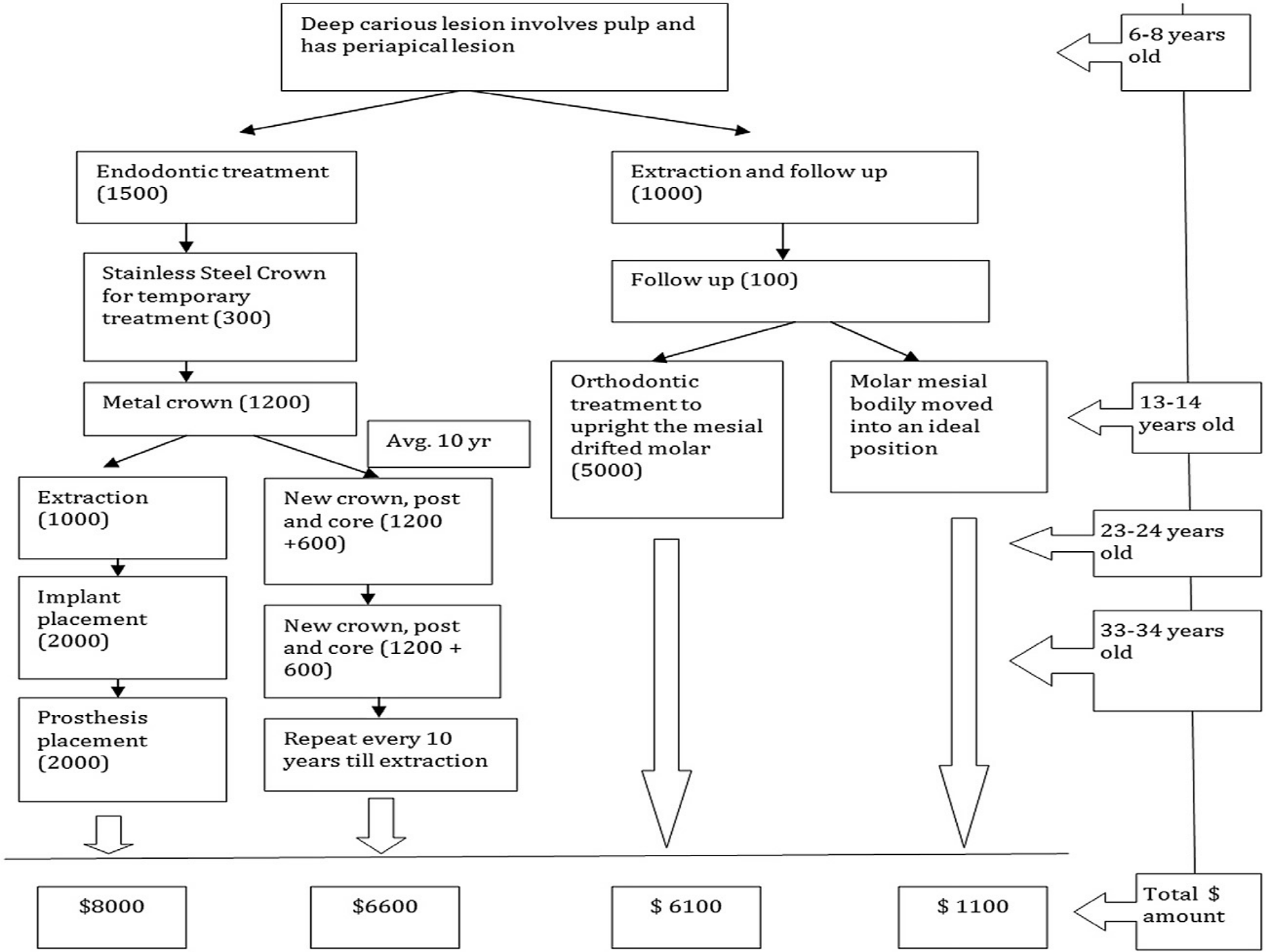


* Early caries
* survival rate of a full coverage crown for 10 years is about 95–98%
* Cycle of 10 years redo crown
* Till implant or extraction

Cost and benefit

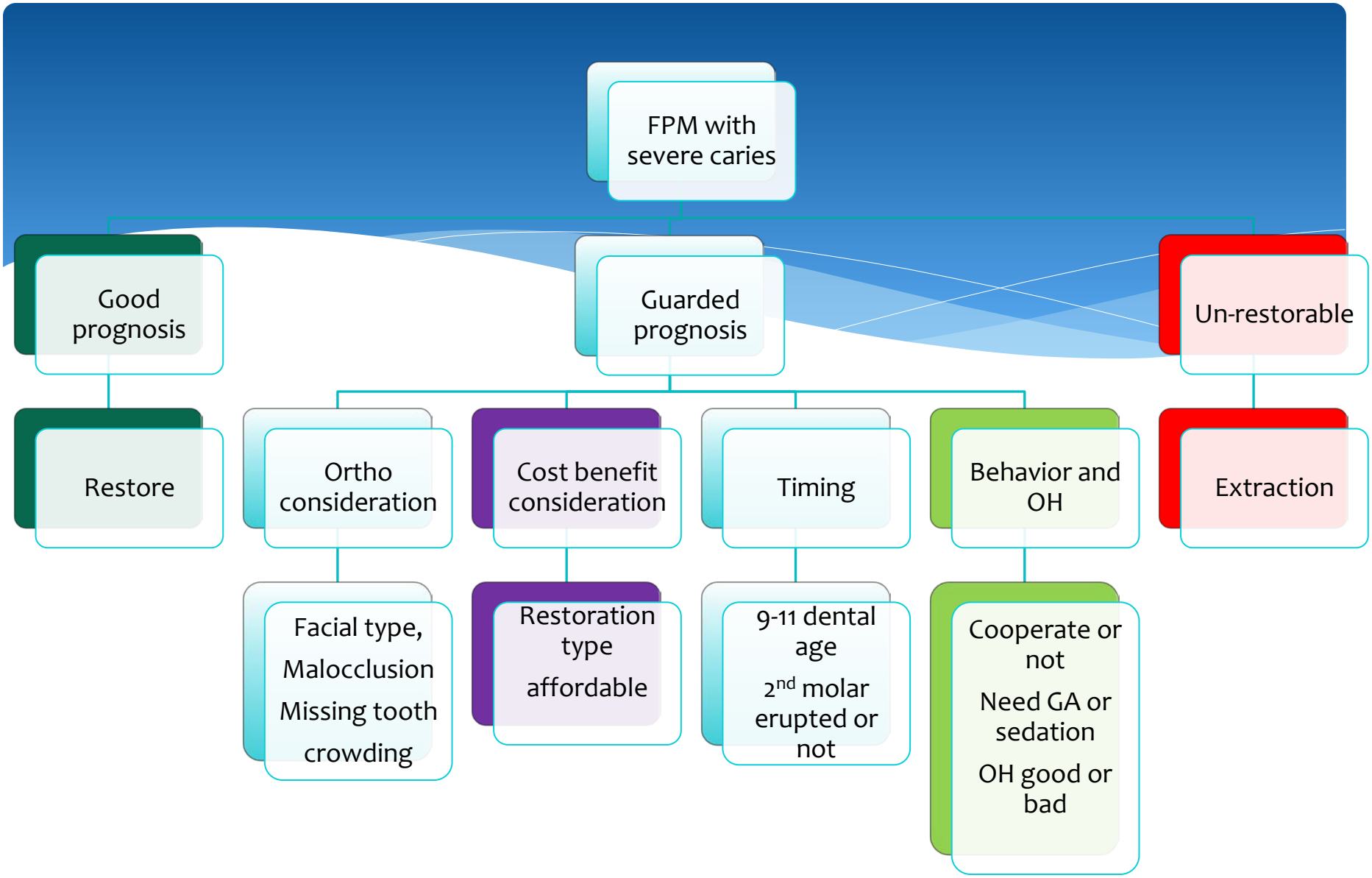


* orthodontic treatment may or may not be needed
* Ortho needed when the angulation or spacing issue

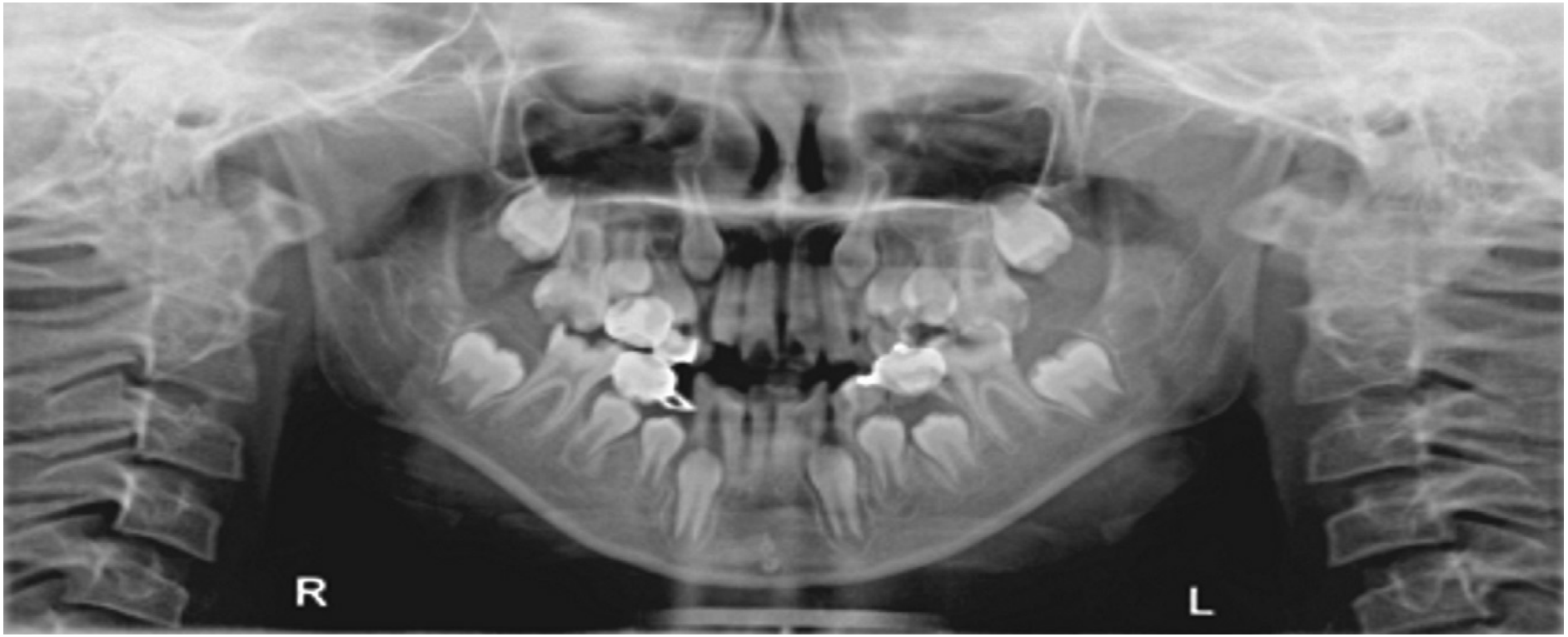

Deep carious lesion involves pulp and has periapical lesion
6-8 years old
Endodontic treatment (1500)
Extraction and follow up (1000)
Stainless Steel Crown for temporary treatment (300)
Follow up (100)
Metal crown (1200)
Orthodontic treatment to upright the mesial drifted molar (5000)
Molar mesial bodily moved into an ideal position
13-14 years old
Avg. 10 yr
Extraction (1000)
New crown, post and core (1200 +600)
23-24 years old
Implant placement (2000)
New crown, post and core (1200 + 600)
33-34 years old
Prosthesis placement (2000)
Repeat every 10 years till extraction
$8000
$6600
$ 6100
$ 1100
Total $ amount

Considerations before extracting first permanent molar

- Long term prognosis?
  - abnormal tooth structure
  - Endodontic treatment
  - attitude of child and parent regarding dental care
  - Oral Hygiene
  - patient cooperation
- Congenital absence of teeth
- Hypoplasia of premolars
- Stage of dental development
- Type of malocclusion
- Degree of crowding


FPM with severe caries
Good prognosis
Guarded prognosis
Un-restorable
Restore
Ortho consideration
Cost benefit consideration
Timing
Behavior and OH
Extraction
Facial type,
Malocclusion
Missing tooth
crowding
Restoration type
affordable
9-11 dental age
2nd molar erupted or not
Cooperate or not
Need GA or sedation
OH good or bad

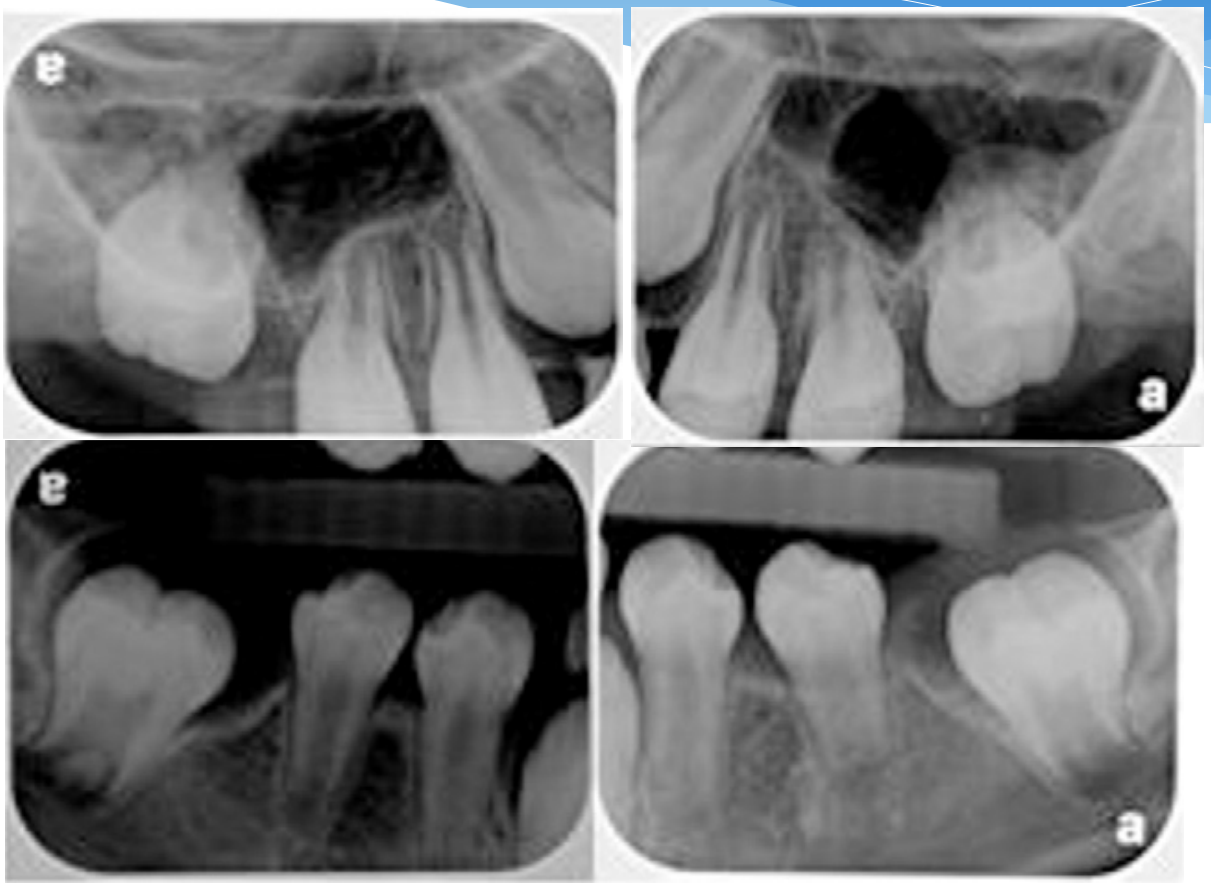
Case 1



Initial exam 9y 5m

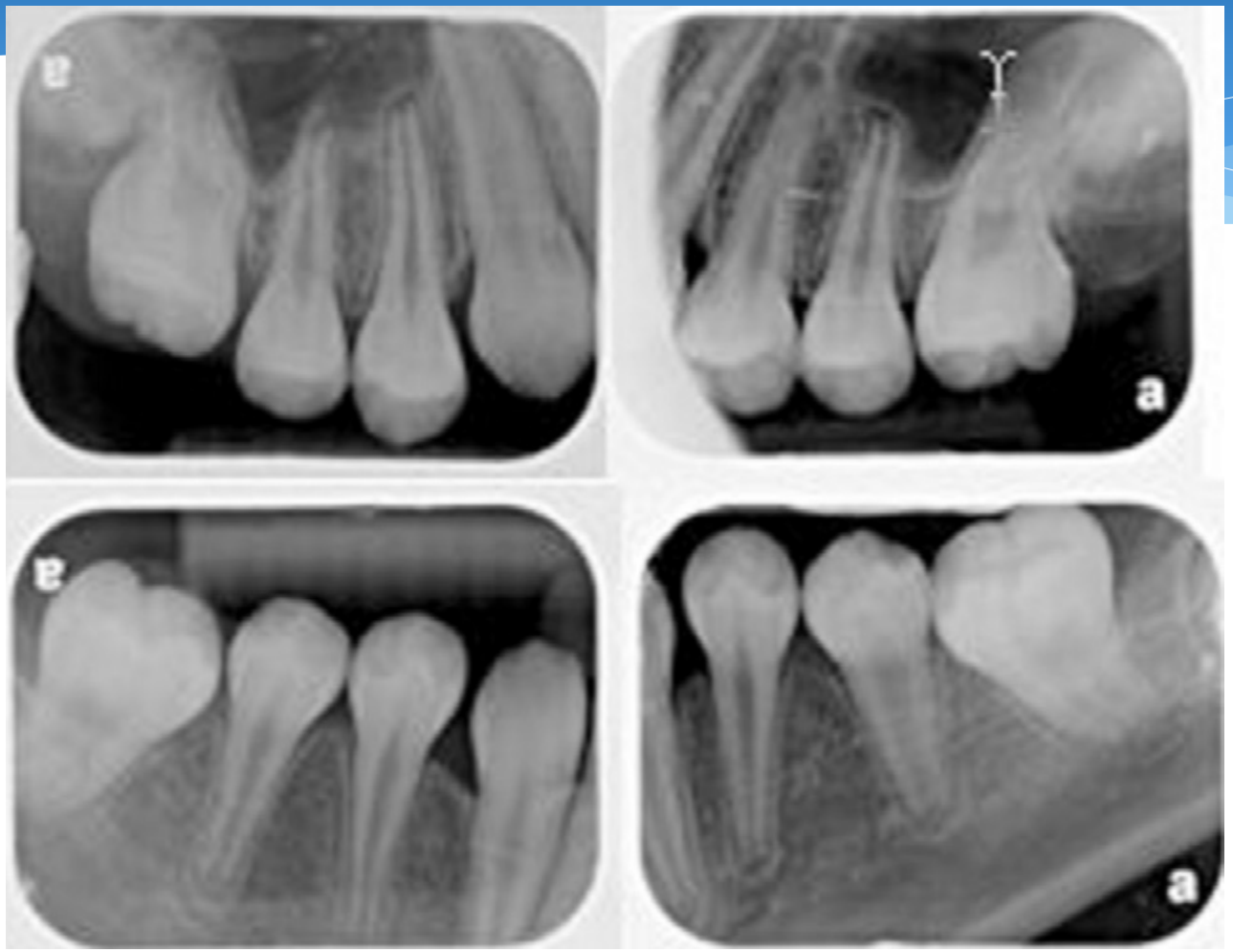
Initial exam (9y5m)

11 month after extraction (10y4m)



Note that the second molars have not erupted yet, however significant mesial movement of the tooth buds can be observed radiographically.

25 month after extraction (11y6m)

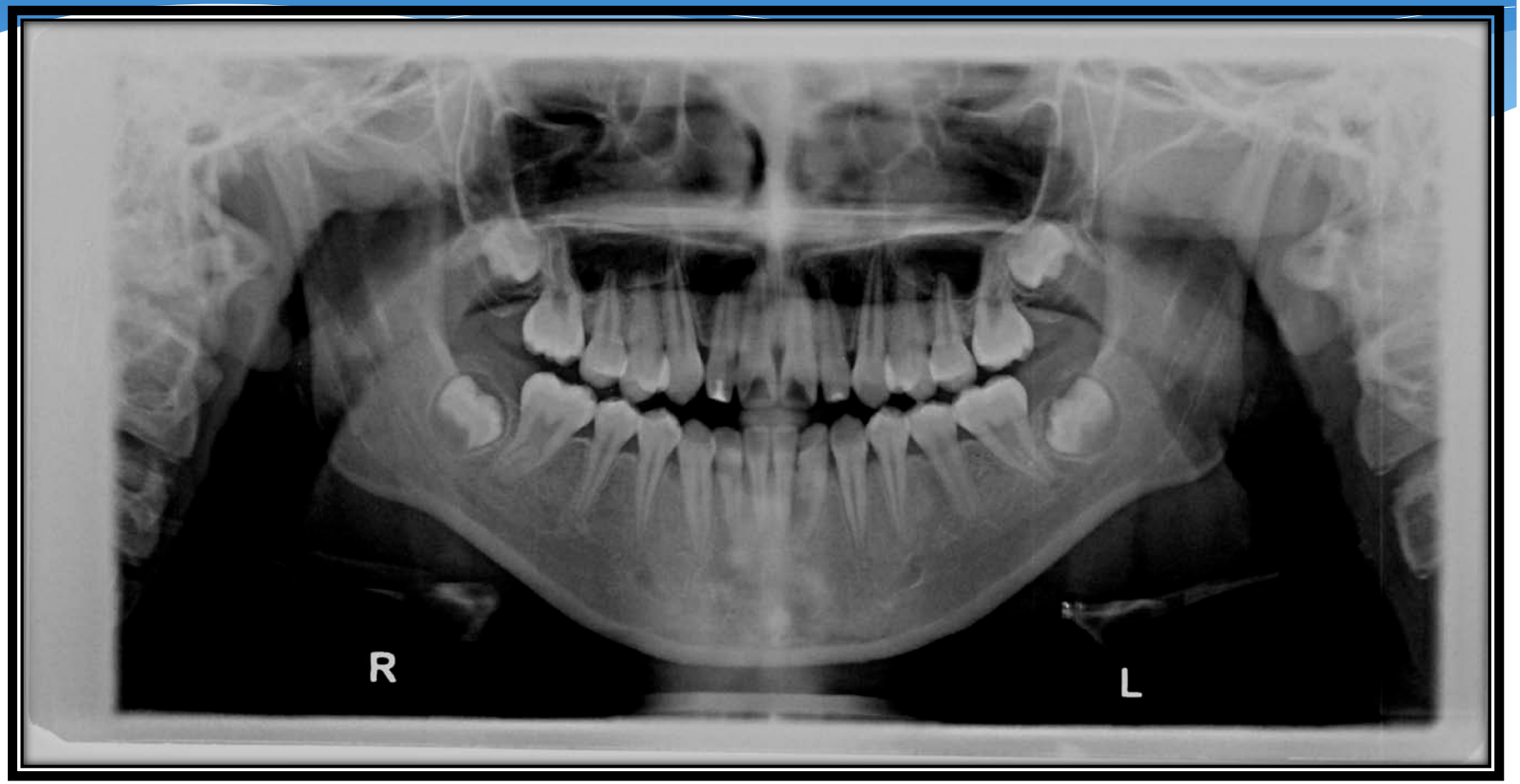


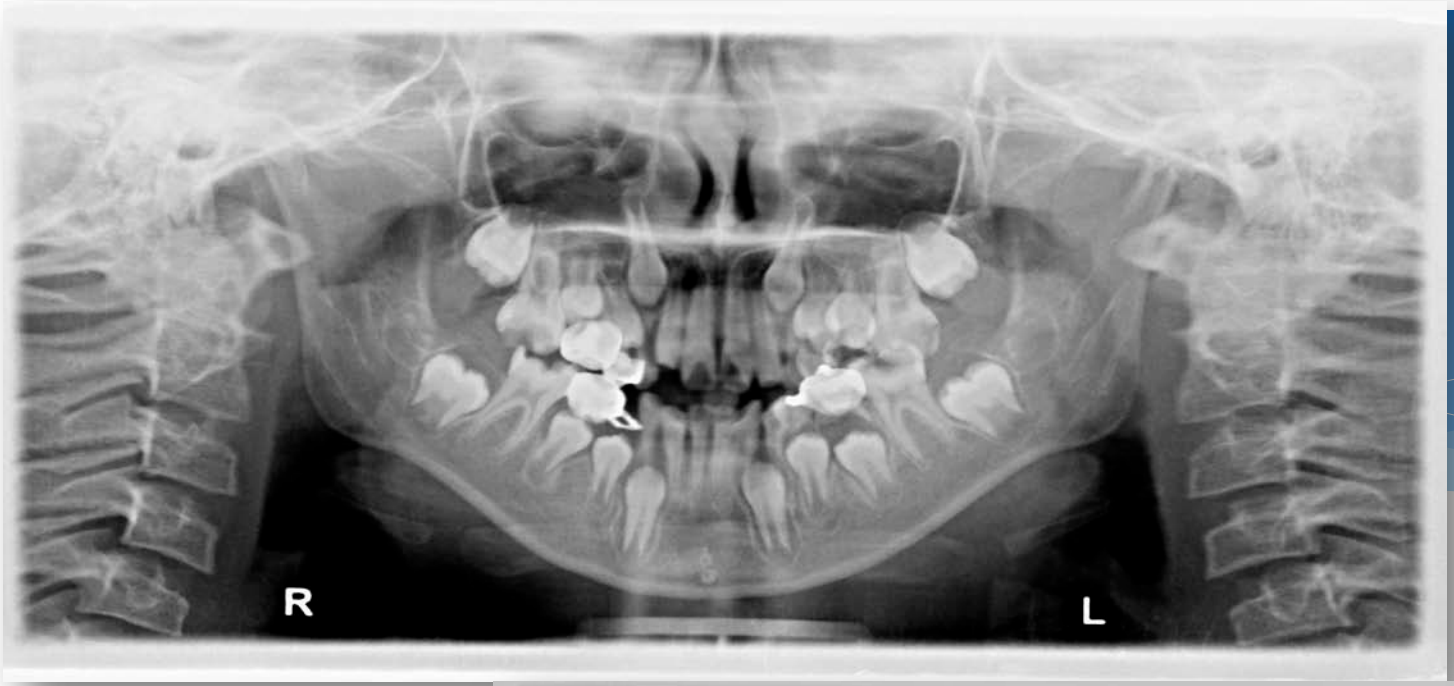
Teeth #18 and 31 have moved mesially into ideal position; teeth #2 and 15 are still moving. The patient didn't receive any orthodontic treatment.

31 month after extraction (12y1m)

second molars have moved into the first molars' position and appear to be in optional occlusion with optimal angulation and no periodontal problem.

48 month after extraction

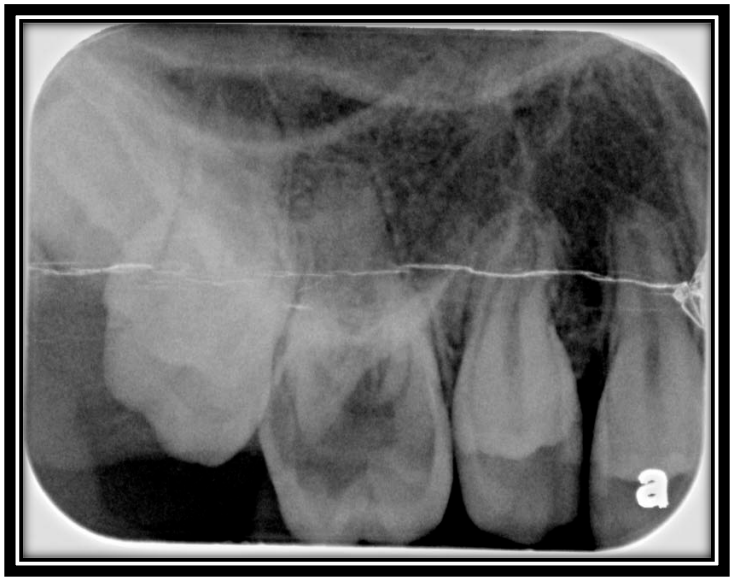




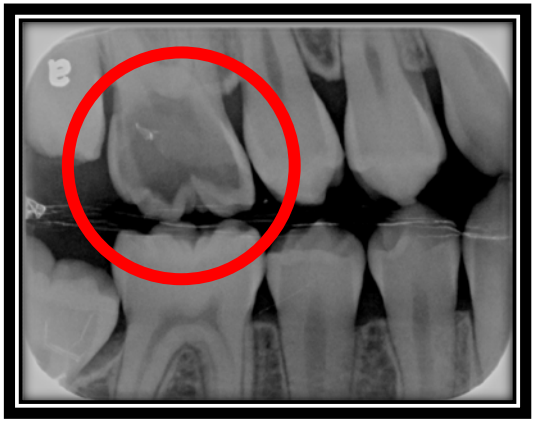
Initial visit:
9y/o

4 years later…
13 y/o

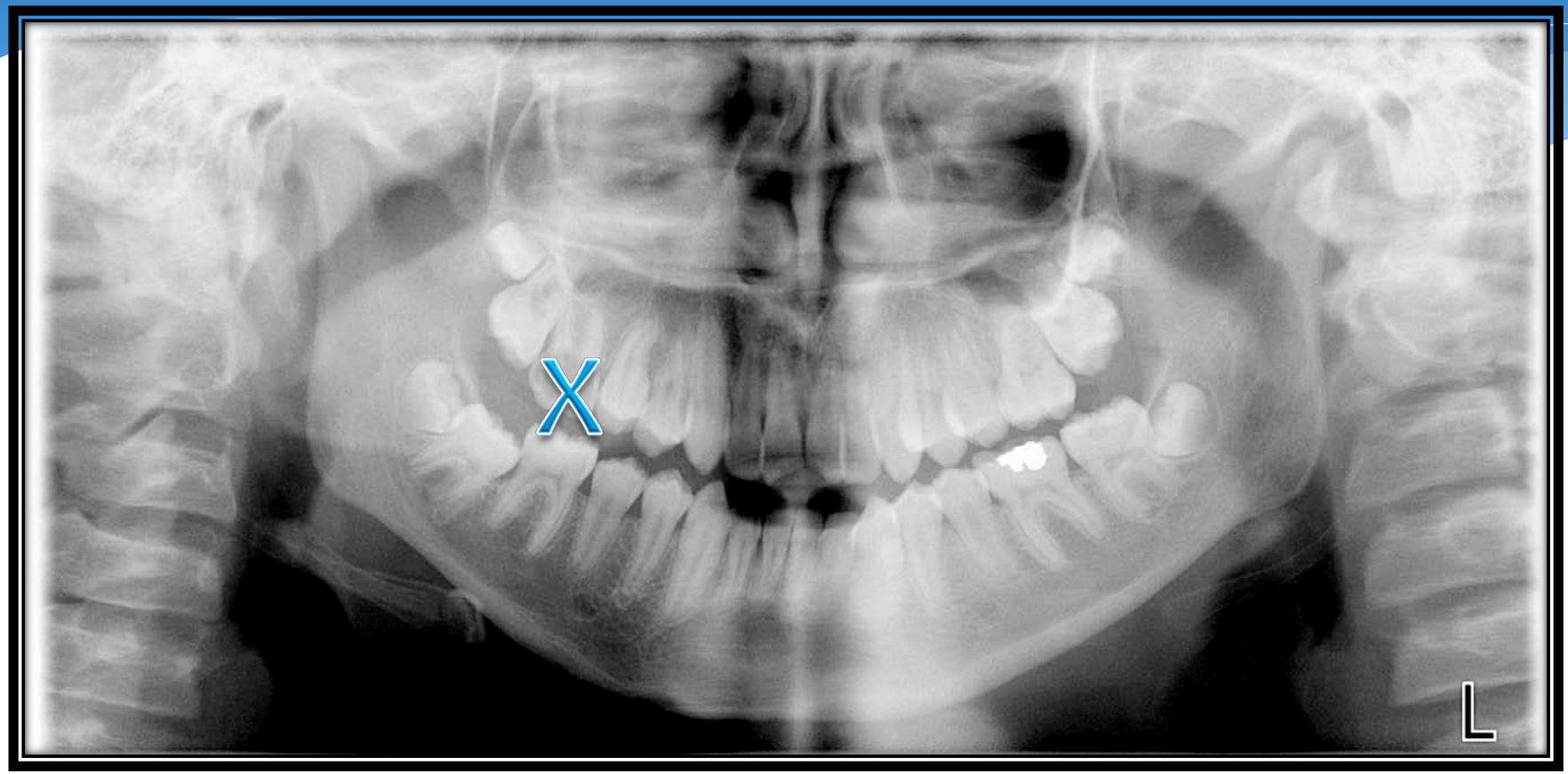
Case II



* 13 y/o
* Special need patient

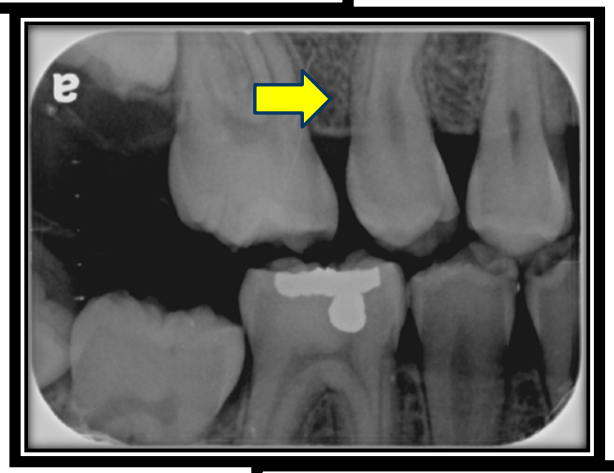


Initial Exam (9/29/2008)

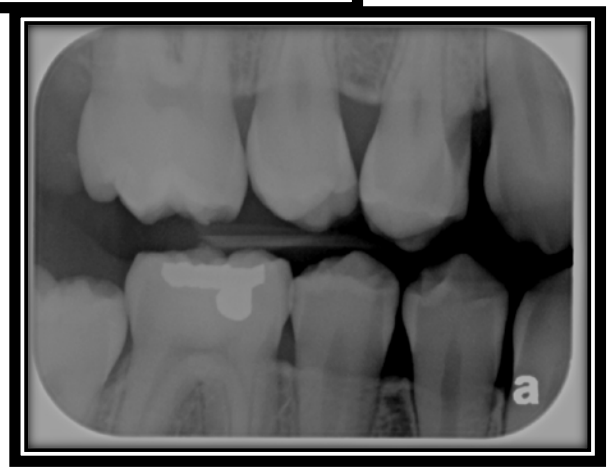


5/19/2009: Treatment in SCD under GA
Extract tooth #3

Initial visit:
extract #3



~2 years later…



4 years later…

Conclusion

* The FPMs have the highest incidence of caries in the permanent dentition, which usually results in pulpal involvement requiring endodontic therapy.
* Early extraction of FPMs can be one of the treatment choice, if the patient meets the following criteria:
  (i) Class I occlusion;
  (ii) premolar crowding;
  (iii) no missing permanent teeth;
  (iv) FPMs with poor treatment prognosis;
  (v) dental age of 9–11.
* A careful consideration and evaluation of risks and benefits for young patients with regards to **long term** treatment planning is essential for the best outcome.

Thank You!

* Any question?

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