Hall Technique Crowns

DR JUDI HUMPHREYS

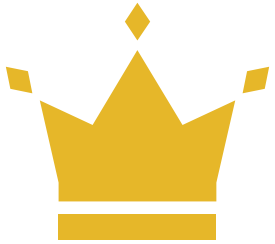
SENIOR LECTURER / HONORARY CONSULTANT PAEDIATRIC DENTISTRY

BDS(HONS) MFDS M PAED DENT DDSC PGCE FDS (PAED DENT) RCS ENG

JUDIH@LIVERPOOL.AC.UK

Introductions…

Where are you from?



Have you used Hall crowns before?

Where and when did you graduate?

Learning Outcomes

- **Aim:**
- Improve confidence in case selection and placement of Hall technique pre-formed metal crowns in children.

(ILO) At the end of this session delegates should be able to:

- Understand background to Hall technique crowns
- Describe indications and contraindications for Hall technique
- Understand behavioural management techniques for placing 'Hallcrowns'
- Demonstrate fitting a Hall technique crown in simple steps

What is the Hall Technique?

- Use of a preformed metal crown without caries removal or reduction of crown, or local anaesthetic

- Advantages:
  - Avoid using drill or needle
  - minimally invasive,
  - reduce risk of pulp exposure,
  - high success / survival

- Disadvantages:
  - Aesthetics

Who was Norna Hall?

- Norna Hall was a GDP from the Grampian region of Scotland
- She used the 'Hall technique' for over 15 years before retiring in 2006
- She came to the attention of the health board for an unusually high use of preformed metal crowns
- University of Dundee then carried out a retrospective analysis of the success of her crowns
- They found her success rate was comparable to conventional restorative techniques (80% at 3 years, 86% at 5 years)

Innes, N., Stirrups, D., Evans, D. *et al.*
A novel technique using preformed metal crowns for managing carious primary molars in general practice — A retrospective analysis. *Br Dent J* **200**, 451–454 (2006).

Professor Nicola Innes

- Nicola Innes led this research, and following on from the retrospective analysis, planned an RCT with results published in 2007

- Split mouth design
- 132 children aged 4-9 with no significant health issues were recruited
- 17 GDPs / dental practices recruited after training
- Teeth matched for arch, extent of caries and tooth type (D/E)
- 1 tooth had PMC and 1 tooth had 'conventional' restoration e.g. caries removal and GIC

Innes, N.P., Evans, D.J. & Stirrups, D.R. The Hall Technique; a randomized controlled clinical trial of a novel method of managing carious primary molars in general dental practice: acceptability of the technique and outcomes at 23 months. *BMC Oral Health* **7**, 18 (2007).

Professor Nicola Innes

- 124 control and hallcrown teeth were analysed for success at 23 months:
- The Hall PMCs outperformed the control restorations:
- a) 'Major' failures (signs and symptoms of irreversible pulpal disease): 19 Control restorations (15%); three Hall PMCs (2%) ($P < 0.000$);
- b) 'Minor' failures (loss of restoration, caries progression): 57 Control restorations (46%); six Hall PMCs (5%) ($P < 0.000$)
- c) Pain: 13 Control restorations (11%); two Hall PMCs (2%) ($P = 0.003$).

Professor Nicola Innes

- Since 2007 the Hall Crown has become gold standard for restoration of primary molars with 2-surface caries / cavitated occlusal lesions.
- Research has been repeated in Europe and in secondary care in the UK.
- Banihani 2017
- Santamaria 2017

Innes, N., Evans, D., Bonifacio, C. *et al.* The Hall Technique 10 years on: Questions and answers. *Br Dent J* **222**, 478–483 (2017).

Santamaria 2017

- Secondary care in Germany
- Children aged 3-7 years
- 142 children assessed after 1-33 months
- Hall technique vs caries removal vs non-resto caries treatment

Santamaria 2017

- Minor failures (reversible pulpitis, caries progression, 2nd caries)

  HT = 2, NRCT = 9, CR = 14 p = 0.013, CI = 0.012-0.018
- Major failures (irreversible pulpitis, abscess, unrestorable tooth)

  HT = 1, NRCT = 4, CR = 5 *p* = 0.043, CI = 0.034-0.045
- Cumulative survival rates were

  HT = 92.5%, NRCT = 70.5%, and CR = 67.2% (*p* = 0.012)

Banihani 2018

- Comparison between Leeds (conventional resto) and Sheffield (HT)
- Retrospective cohort 246 children aged 4-9 years
- 836 primary teeth restored
- 388 teeth had Hall Technique preformed metal crowns (PMC) placed
- PMC were the restoration of choice for most of the cases where a pulpotomy had been carried out, and resin composite was most frequently used restorative material for the conventional caries removal group.

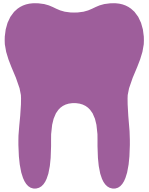
Banihani 2018

- Asymptomatic teeth: 95.3% in the conventional and 95.8% in the biological.
- No significant association was found between the final outcome and the approach used for treatment, age of the patient, gender and number of carious surfaces or tooth type.

Why does it work?

A well sealed restoration will starve cariogenic bacteria

Flexion in the preformed metal crown helps create a good seal



Total caries removal no longer recommended

Indications:

Cooperative child (can they tolerate bitewing radiographs?)

Caries into middle 1/3 of dentine with clear band dentine before pulp (cavitated lesions on primary molars sometimes too deep)

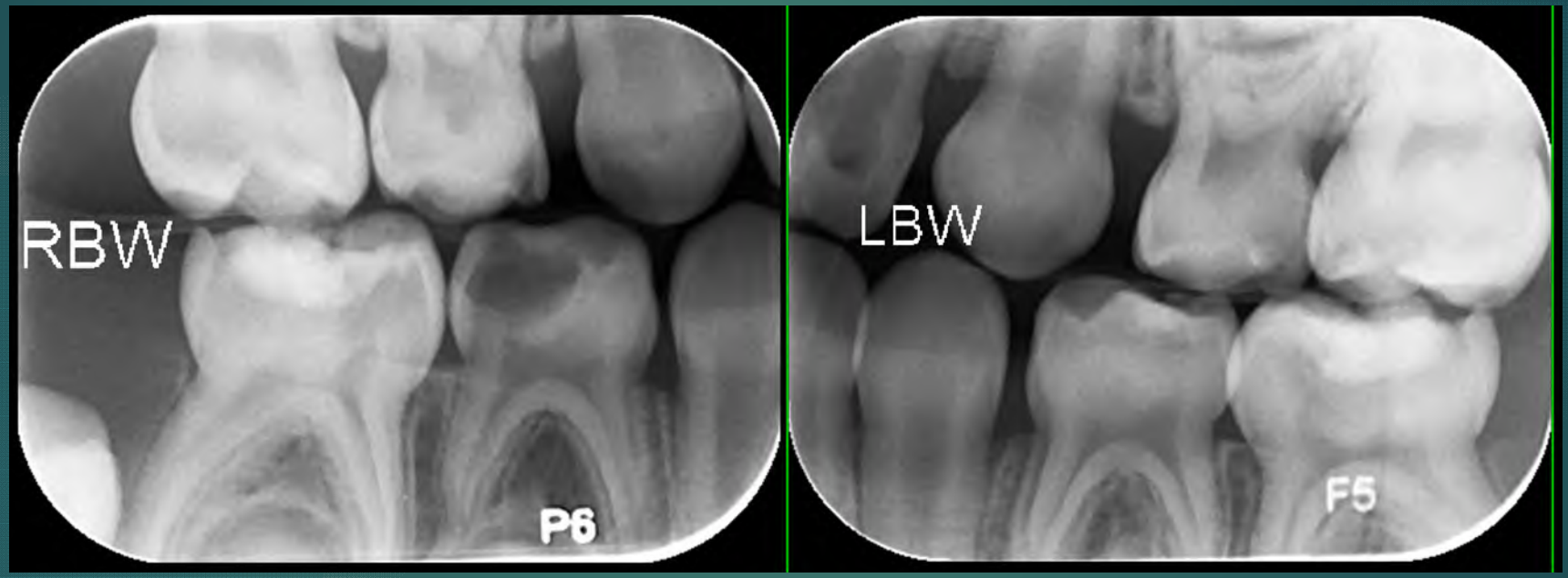
Asymptomatic or mild reversible pulpitis

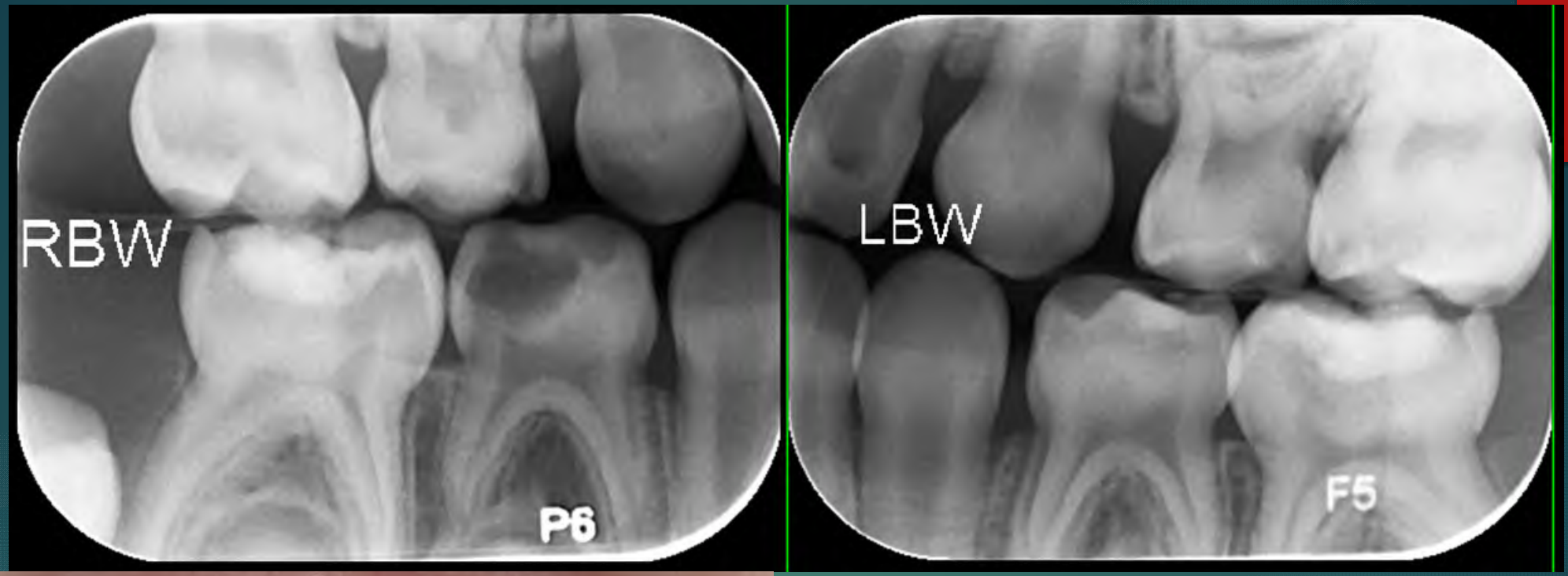
Contraindications

Irreversible pulpitis → Evidence of radicular pathology radiographically or abscess clinically → Tooth close to exfoliation

Case selection and treatment planning

Case 1



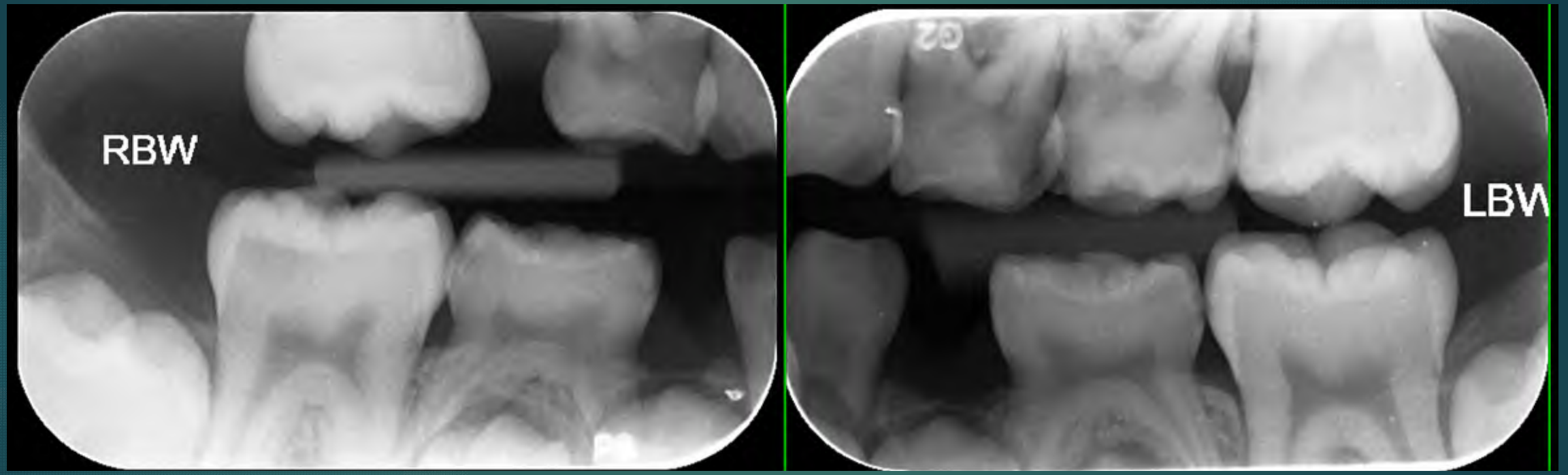

RBW
P6
LBW
F5

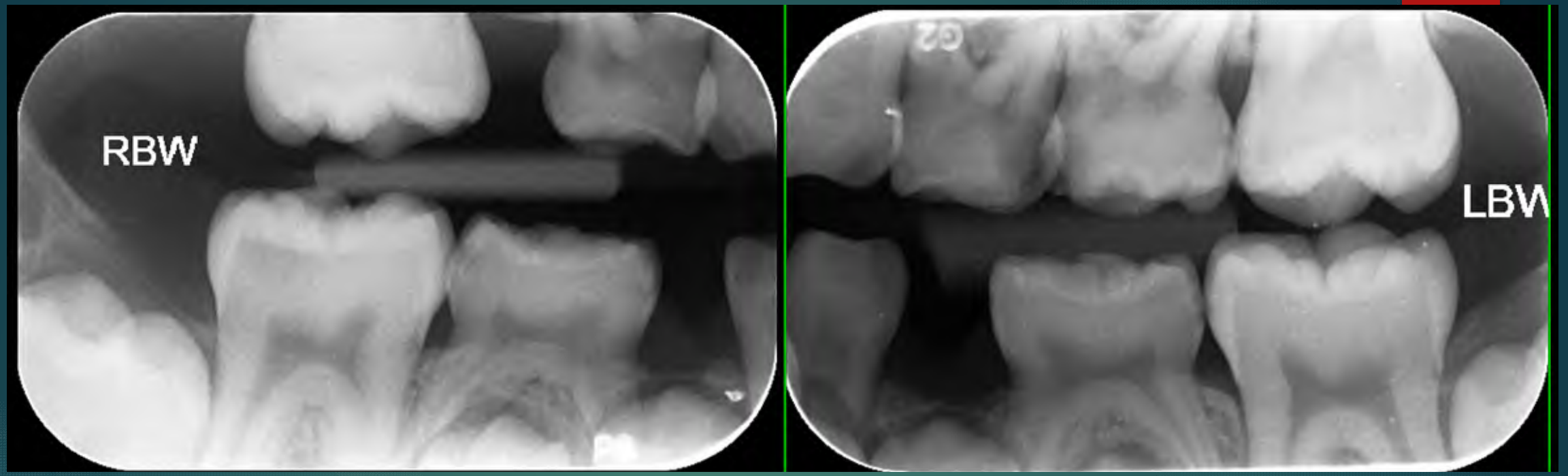
Case 2


RBW
M7

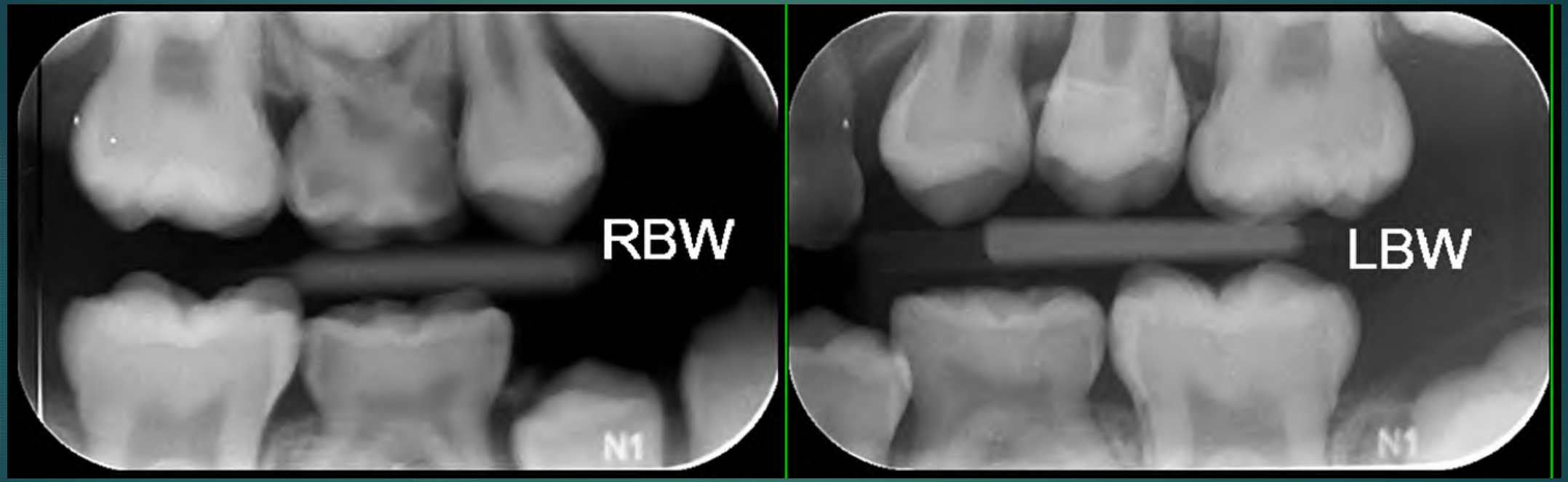

LBW

Case 3


RBW
LBW

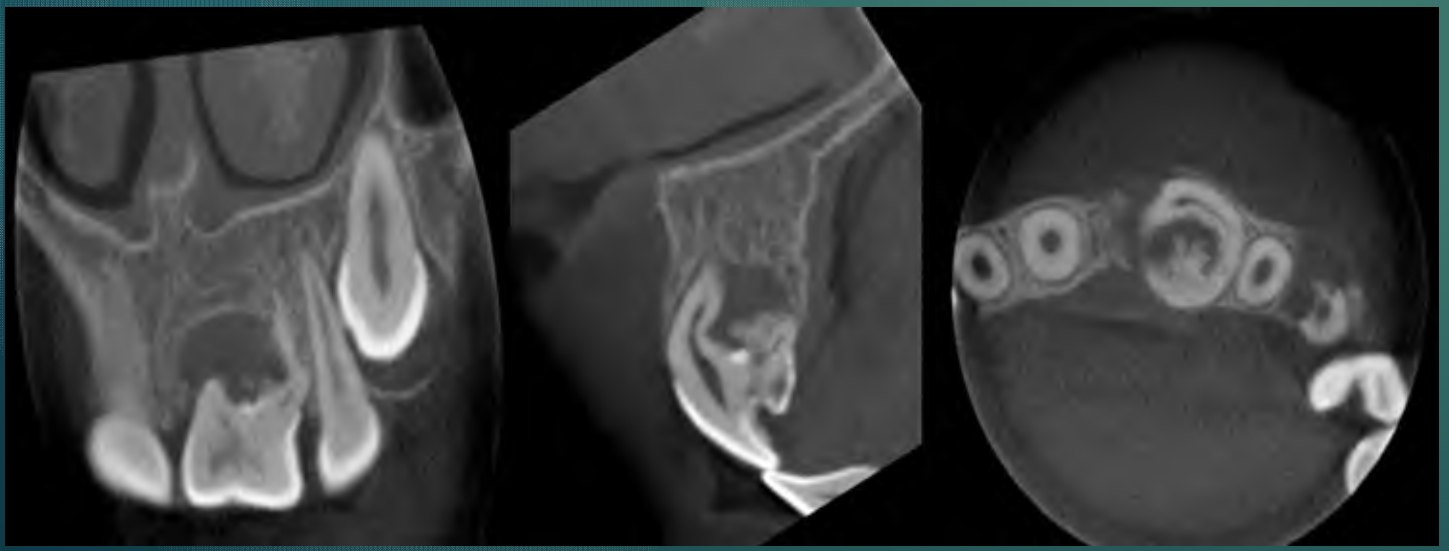

RBW
LBW

Case 4

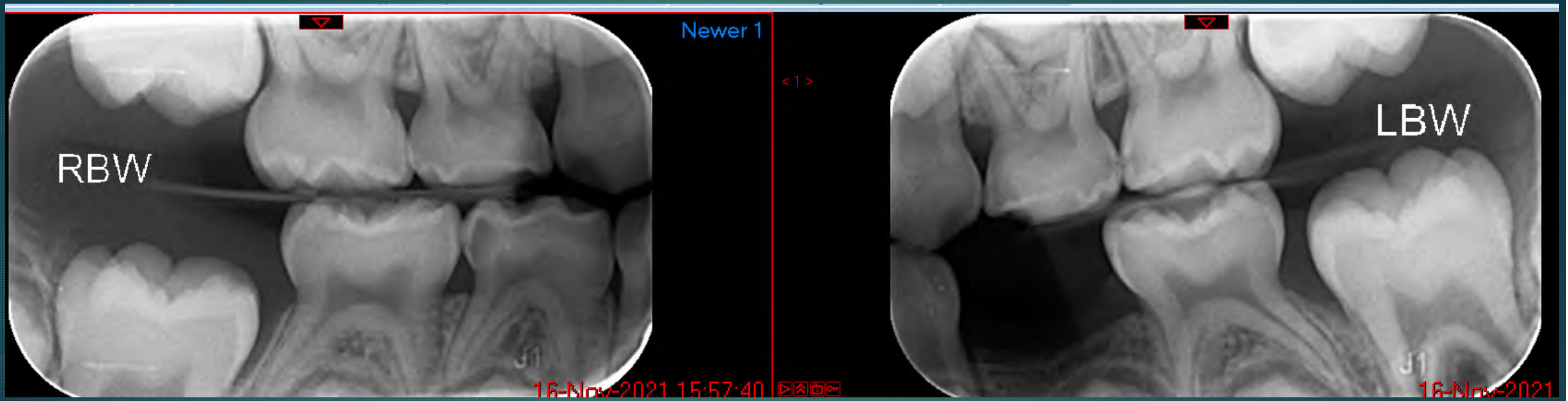


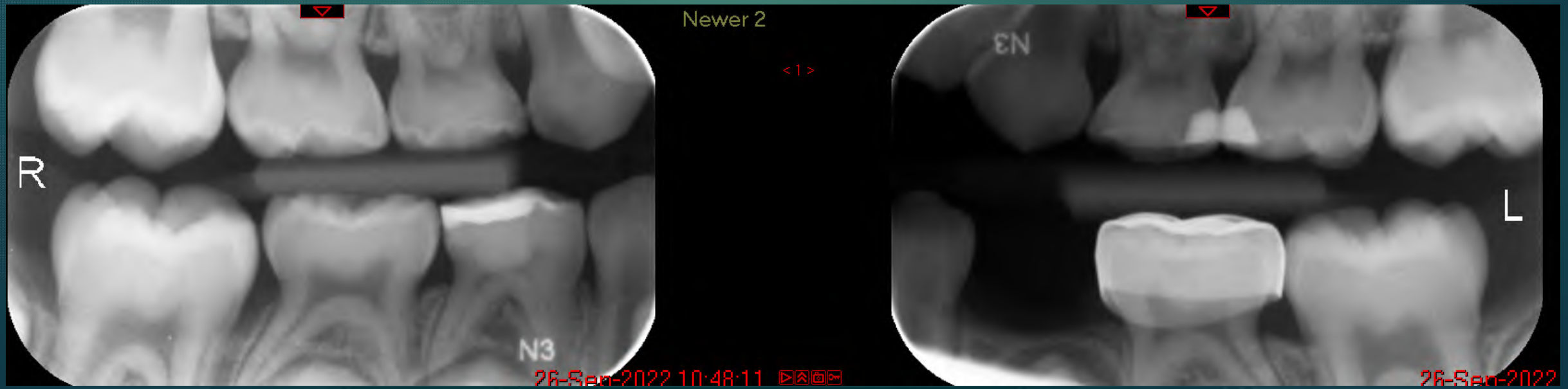

RBW
N1


LBW
N1

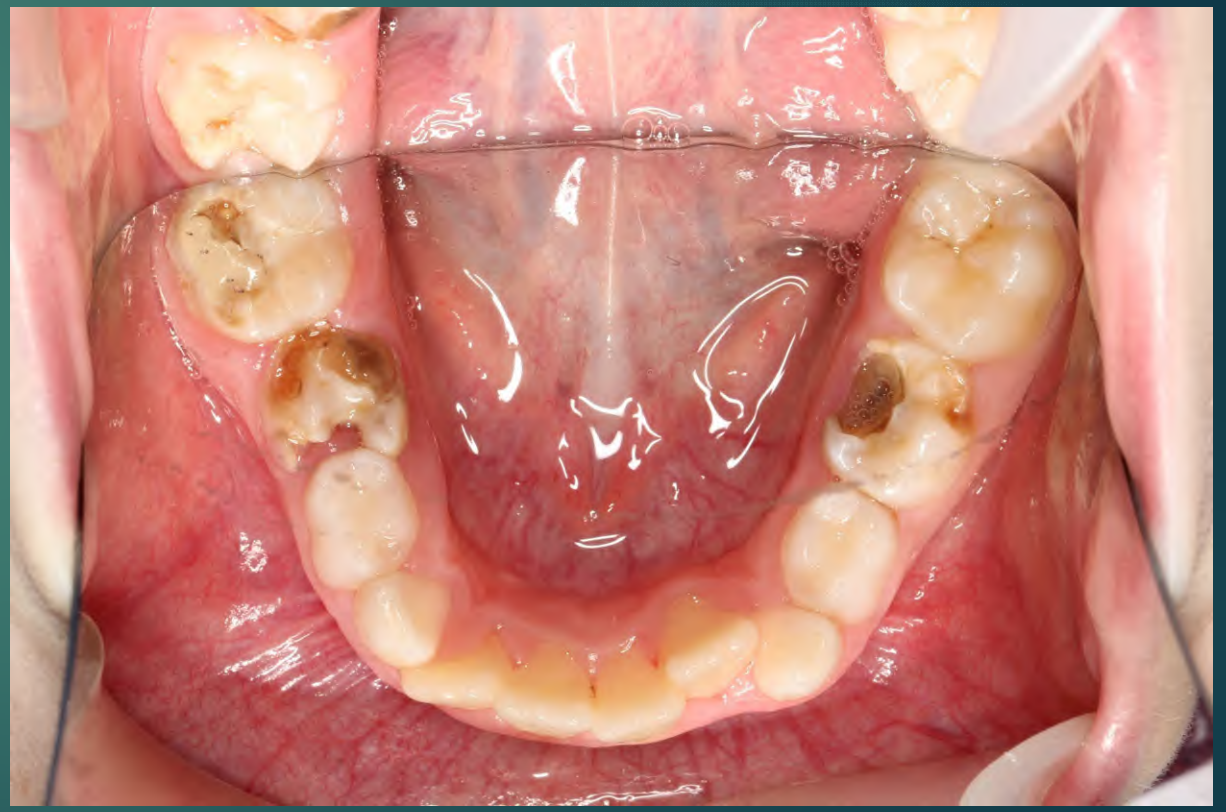


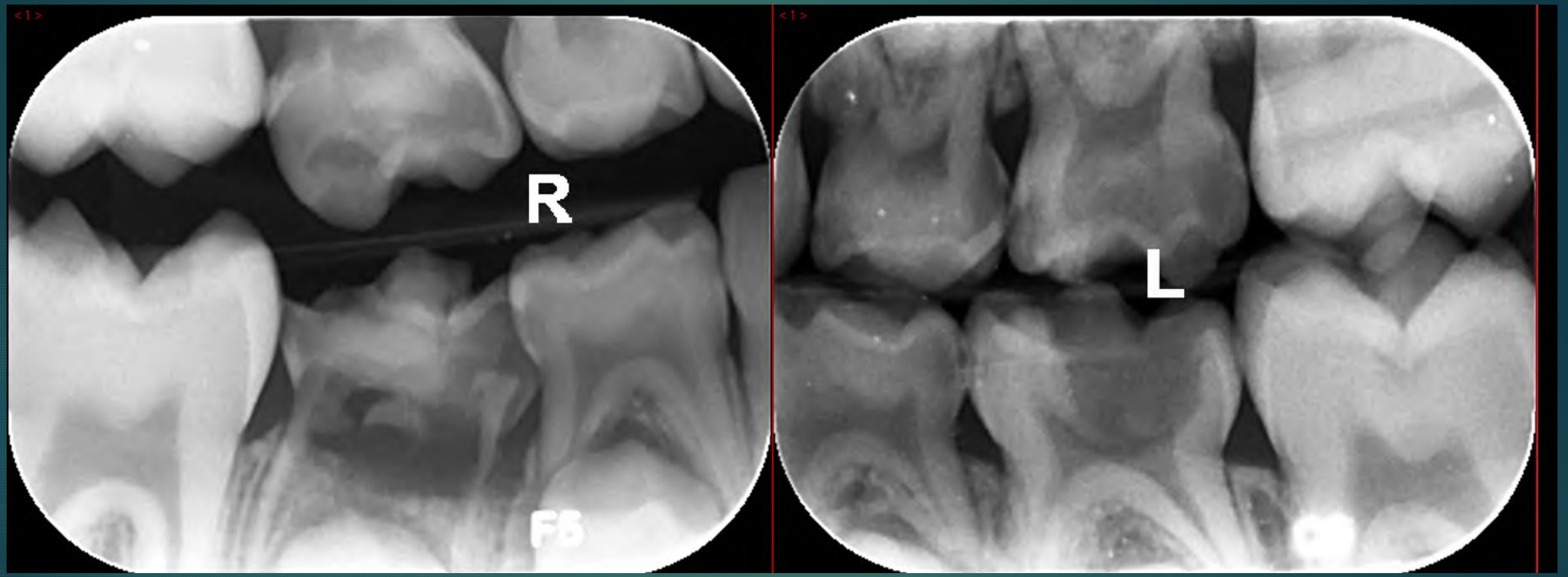
Case 5

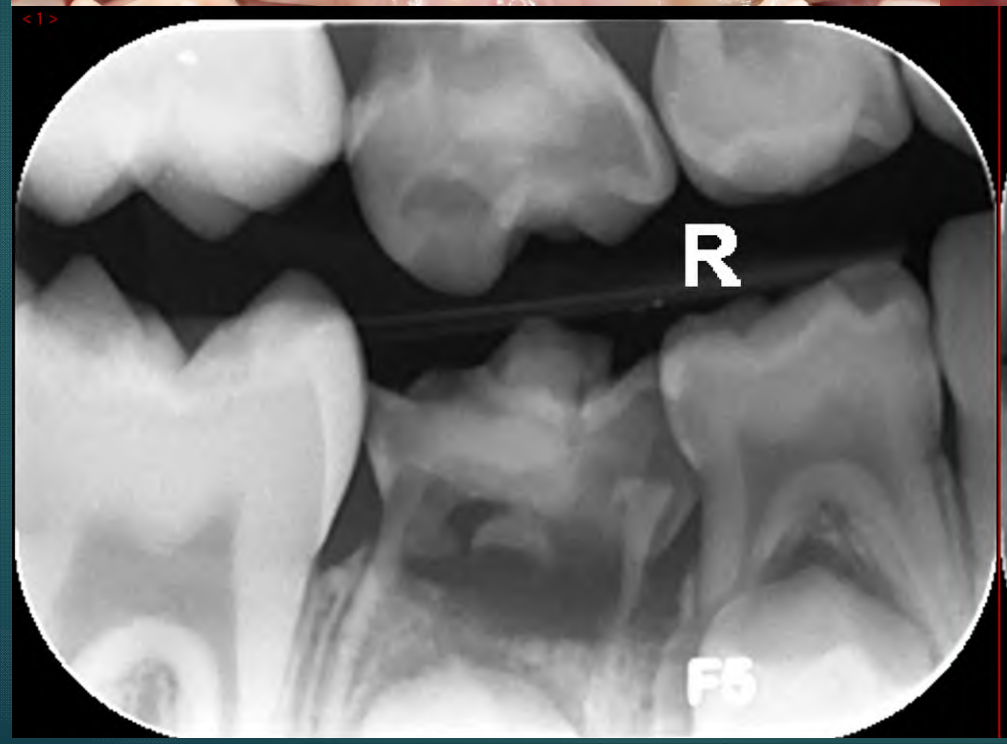



Newer 2
< 1 >
R
N3
L
26-Sep-2022 10:48:11
26-Sep-2022

Case 6

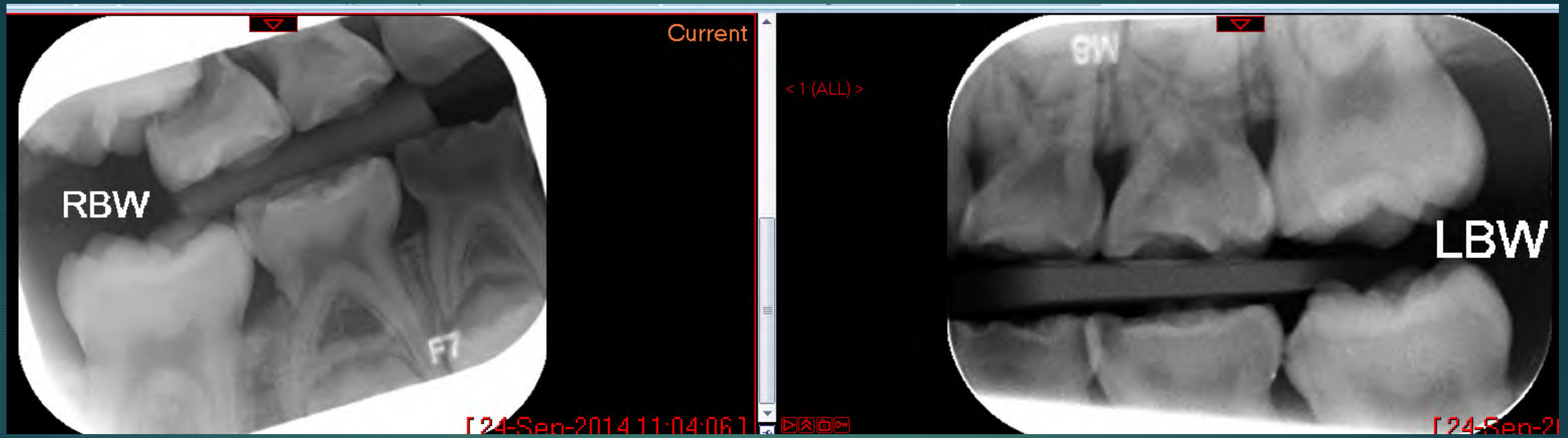


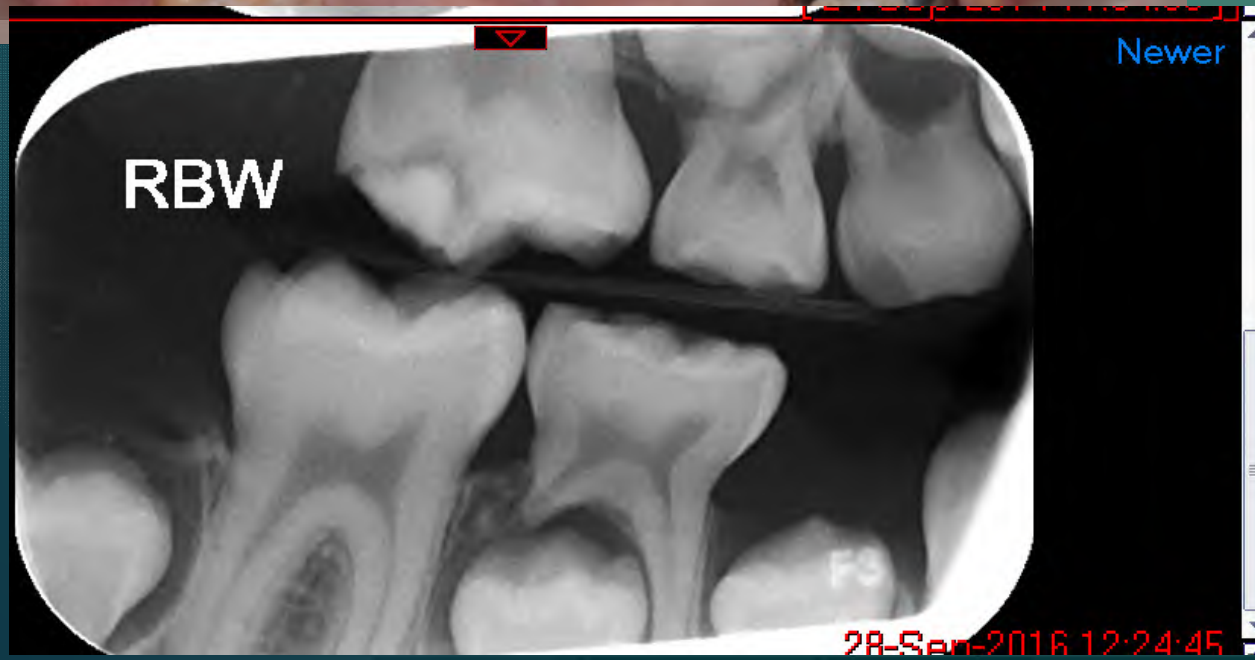

R
L


R


L

Case 7




Newer
RBW
28-Sep-2016 12:24:45


< 1 (ALL) >
LBW

The procedure

Step 1

- Not always necessary
- Separators - distal and mesial to tooth where space not sufficient
- Use separator forceps, mosquito forceps or floss
- Will feel like some food has got stuck between teeth but settles quickly
- Use ideally 5-7 days before next visit

Step 2

- Remove separators with probe
- Select crown
- Use callipers
- Use BPE probe
- Eye ball

Step 3

- Trial preformed metal crown – airway protection, micropore tape, sticky microbrushes, sit child up
- PMC should feel springy as you approach the contact point
- Too big – goes over whole tooth with no retention
- Too small – no springy feeling at try in – pushing against hard enamel

Step 4

Child preparation

Make sure child knows what to expect and what is expected of them

Taste, click, cleaning around crown

Biting on cotton wool roll - practice

Step 3

- Airway protection again!
- Nurse to mix GIC into luting consistency
- Fill PMC at least ½ full of cement
- Press onto tooth*
- Excess cement will be displaced – remove
- Get child to bite onto cotton wool roll to help any residual seating discrepancy
- Once cement set remove residual around margins with flat plastic and floss

Step 5

- Check occlusion and reassure
- Post-op advice

https://www.youtube.com/watch?v=TqCaBjSgbbU

https://www.youtube.com/watch?v=ndxQEDw0rAM

PRACTICAL

- Practice using floss and separator forceps
- Practice using tape to help placement
- Select PMC and seat without cement
- Teeth LRE and ULD

Trouble shooting

- Child chews PMC doesn't squeeze PMC
- Doesn't seat fully / seats at an angle
- No PMCs fit because there has been space loss
- Upper Ds and extra cusps

Trouble shooting

- Contact point too tight for separators
- Child loses cooperation with crown half on half off
- Can only place one PMC in a quadrant per visit
- Ideally don't place opposing PMCs at same visit

Cost and remuneration

- Section 44 of SDR – treatment special to minors
- Code 4402 – conservation of a molar with a preformed metal cap inclusive of all preparation
- £22.14
- Placement of separators (5 mins) + placement of crown (5 mins)
- 4 x Es = 40 minutes time for £88.56

Cost and remuneration

- Cost of crowns, floss, GIC, CWR, xrays, separators, time…
- Reduced pain, reduced return for lost fillings, space maintenance
- Early intervention = prevention of need for GA
- Prevention early loss of primary molars = reduction in crowding and need for future orthodontics

Behaviour Management

How do you maximise success with Hallcrowns?

- Children-ese
- Tell show do
- Distraction
- Humour
- Praise
- Stickers

Children-ese

- Using descriptive and playful language to explain dental procedures, instruments and materials

Separators	Loom band, tiny donuts
PMC	Princess crowns, silver hats, iron-man crowns
GIC	Tooth glue (tastes like vinegar)
Etch	Tooth shampoo, lemon jelly
LA	Sleepy juice, cold spray, (feels tingly / spicey)
Suction	Hoover, sucky straw
3in1	Hairdrier, water pistol

Tell-Show-Do

- Tell them
- Show them – practice outside or inside the mouth
- Do it

Distraction

- If patient is concentrating on something else can't fixate on strange feelings or thoughts, helps time go quicker
- Counting (caution – up better than down)
- Music
- iPad
- Talking / telling story
- Squeezy balls / squeezing hands / holding soft toy
- Fidget toys

Humour

- Be interested in child – ask about siblings, hobbies, school, favourite tv shows / computer games, sports clubs etc, pets
- Tell actual jokes
- Physical humour?

Praise

- Be specific – ‘well done getting the bands put in – it feels funny doesn’t it but that will go away soon’
- Well done for trying hard to get the bands / crowns on
- Don’t praise disruptive and wilful naughtiness.

Stickers or rewards

- After the visit give your child a sticker / whatever you use in your practice
- Some kids like to take gloves or masks home to play dentist
- If you use disposable mirror, can give them this too
- Toothbrushes etc

Thanks!