

Deep Margin Elevation vs. Surgical Crown Lengthening

Restorative Strategies for
Subgingival Margins

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- ◇ Understand indications and techniques of DME and SCL
- ◇ Compare advantages and limitations of both methods
- ◇ Evaluate clinical decision-making factors
- ◇ Review case-based outcomes

Objectives

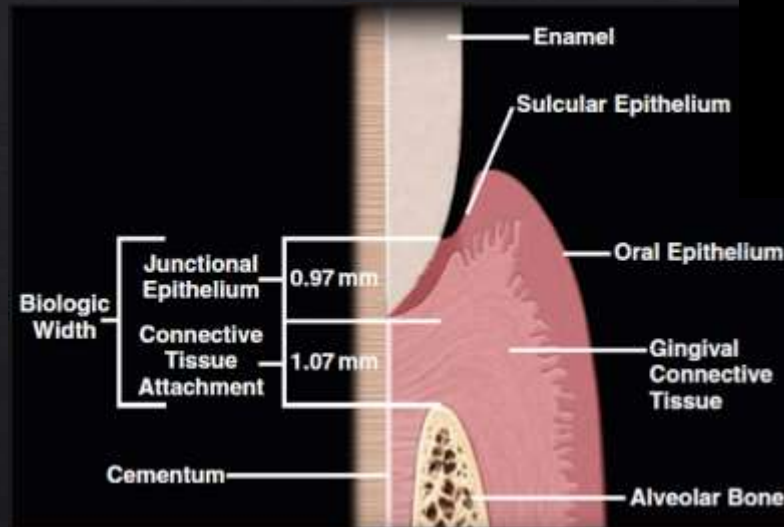
Clinical Challenge

- ◊ Deep subgingival caries or fracture margins
- ◊ Restorative access and isolation issues
- ◊ Biological width violation
- ◊ Medical status of patient
- ◊ Timeline of treatment

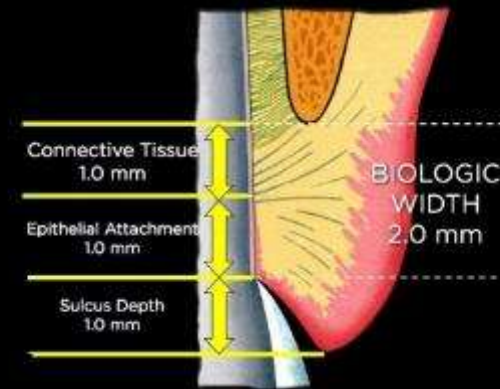
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Biologic Width

- ◇ BW forms a protective barrier around alveolus
- ◇ Protection from disease, infection



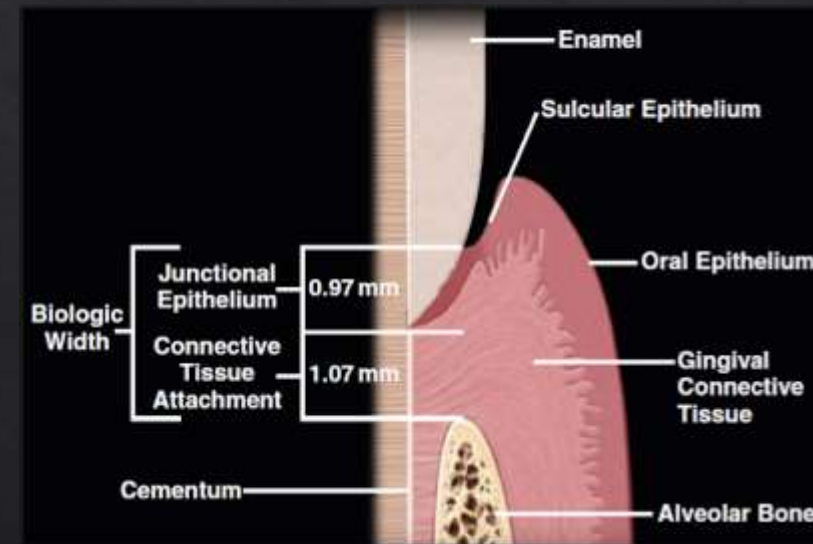
Classic illustration of the average human attachment apparatus as described by Gargiulo, Wentz, and Orban in 1961



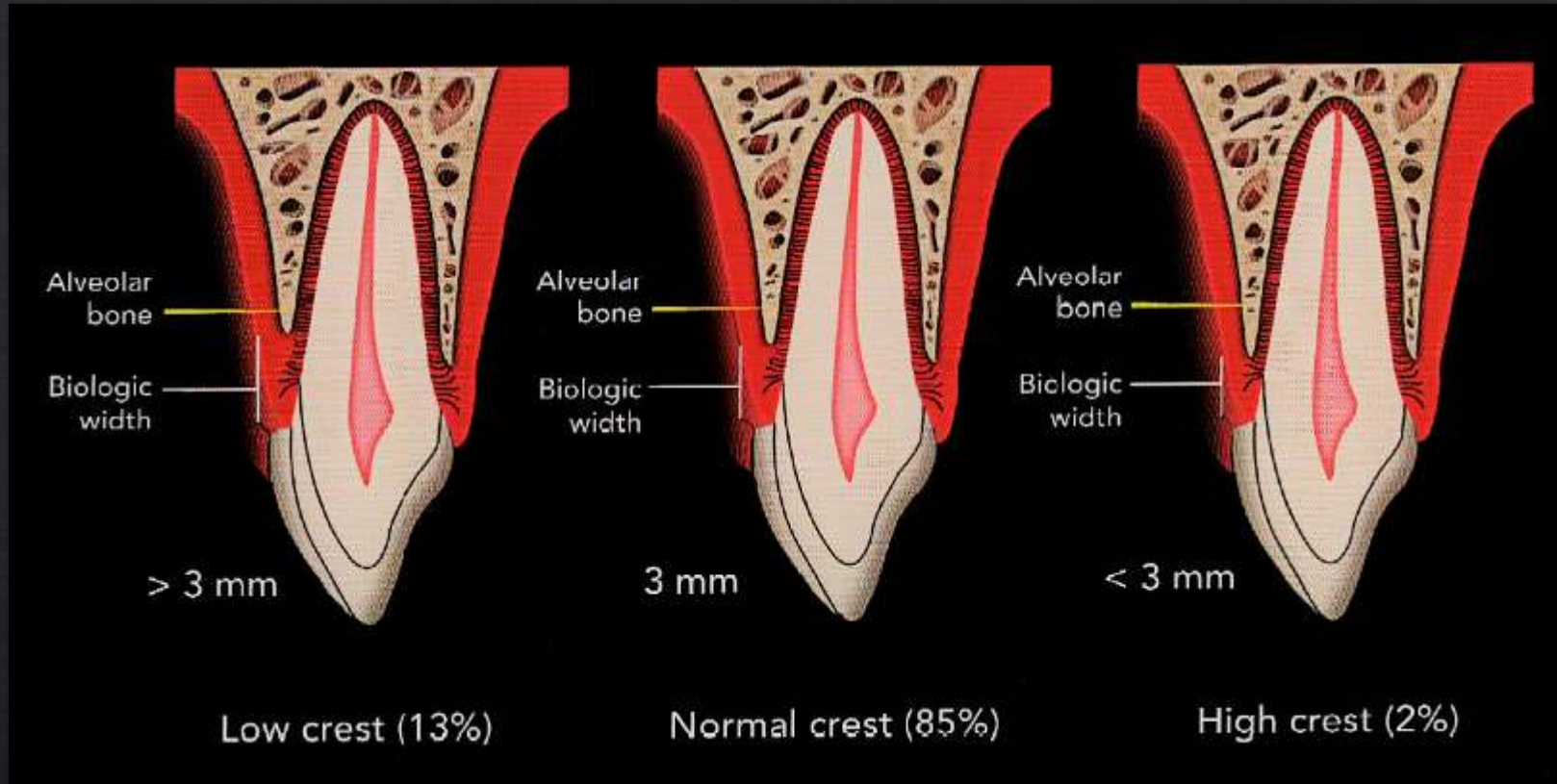
The Connective tissue attachment and epithelial attachment form the "Biologic Width" averaging 2mm in most patients

Biologic Width

- ◆ World Workshop on the Classification of Periodontal and Peri-Implant Disease and Conditions (2018): “Commonly used clinical term to describe the apico-coronal variable dimensions of the supracrestal attached tissues”
- ◆ Considerable variability in JE dimensions both inter and intra-patient
- ◆ CT attachment seems to be the most stable dimension → 1-1.5mm coronal to alveolar crest



Biologic Width – Dentogingival Complex



Kois (1994)

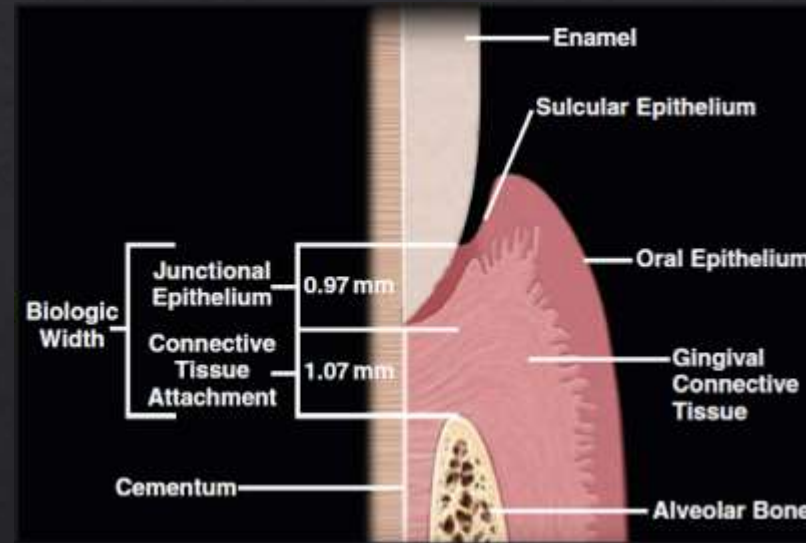
Determining BW

- ◇ Bone sounding
- ◇ Administer local anesthesia
- ◇ Probe to alveolar crest
- ◇ Subtract sulcus depth
- ◇ Need to have healthy gingiva for this to be accurate
- ◇ Alveolar crest – sulcus depth = BW



Biologic Width

- ◆ Placing a restorative margin within connective tissue attachment creates significant risk for patients developing periodontal complications
 - ◆ Gingival inflammation
 - ◆ Clinical attachment loss
 - ◆ Bone loss
 - ◆ Impact on esthetics/comfort



What is goal of DME?

What is the primary purpose of Deep Margin Elevation (DME)?

- A. To reduce root sensitivity
- B. To remove infected pulp
- C. To elevate subgingival margins to supragingival levels
- D. To reshape the gingival contour

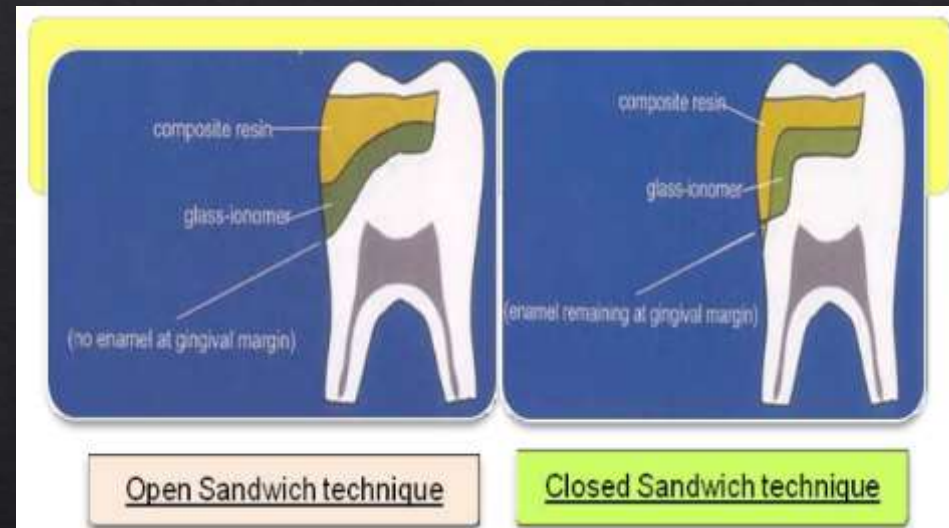
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What is Deep Margin Elevation (DME)?

- ◆ Restorative technique to elevate subgingival margins to supragingival levels
- ◆ Composite resin used to relocate cervical margin in coronal direction
- ◆ Distinct from “open sandwich” technique
 - ◆ GI or RMGI in cervical portion of preparation
- ◆ DME used to improve indirect restorations' outcomes



Why talk about this?

- ◆ 2022 survey: 78% of dentists had >1 concern regarding DME
 - ◆ Isolation
 - ◆ Marginal adaptation
 - ◆ Micro-leakage
 - ◆ Biologic width invasion
 - ◆ Insufficient evidence

DME Indications

Posterior teeth with deep proximal boxes

Esthetic zone – changing gingival architecture

- Lengthened clinical crown
- Flattened papillae
- Black triangles (emergence profile)

When surgical access is difficult or contraindicated

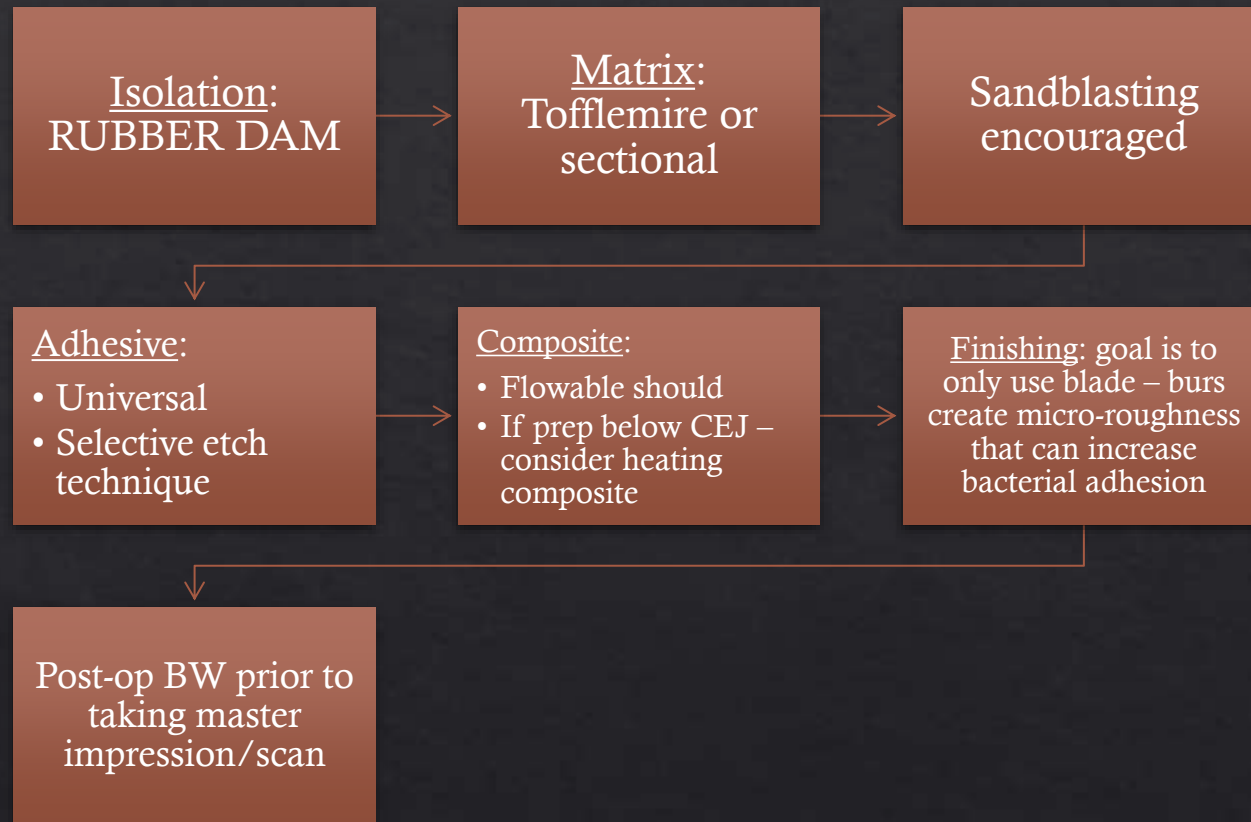
- Limited interseptal bone space for crown lengthening
- Anatomical complications – furcation proximity
- Medical contraindications or patient preference to avoid surgical procedure

Patient preference – no healing time

DME – Indications



How to perform DME?



Levels of Evidence

A. Taylor and L. Burns

Journal of Dentistry 146 (2024) 105066

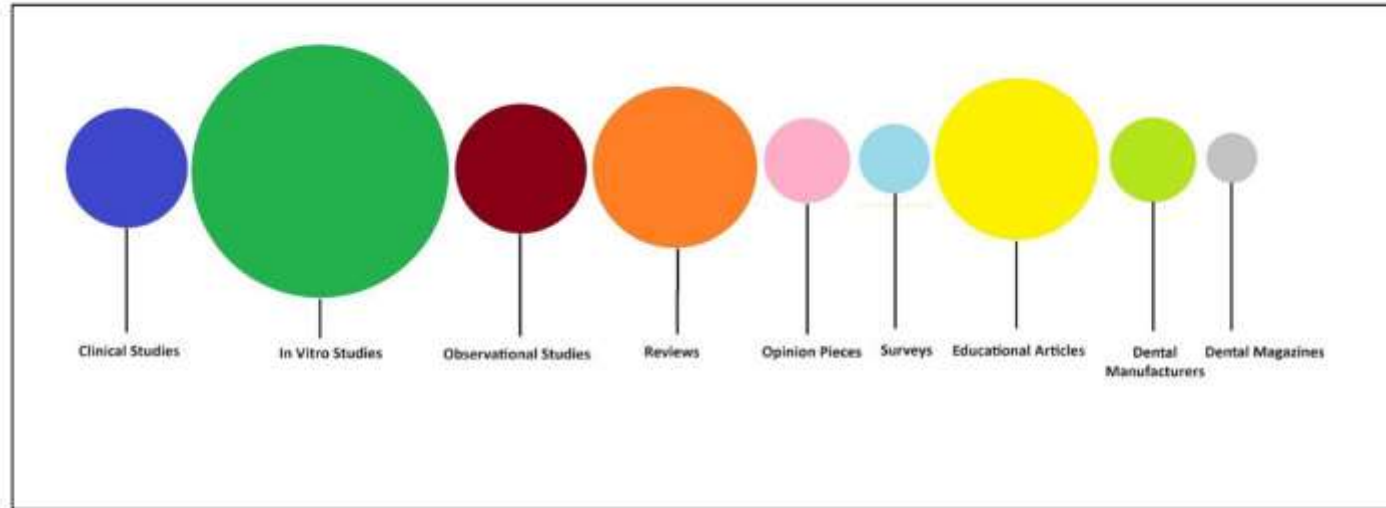


Fig. 2. Proportional area chart illustrating the nature and extent of the evidence base on DME.

Note: The size of the dots represents the proportion of the type of evidence included

Review article

Deep margin elevation in restorative dentistry: A scoping review

Anna Taylor, Principal Dentist^a, Lorna Burns, Information Specialist^{b,*}

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^b Peninsula Dental School, John Bull Building, Research Way, Plymouth, Devon PL6 8BU, UK

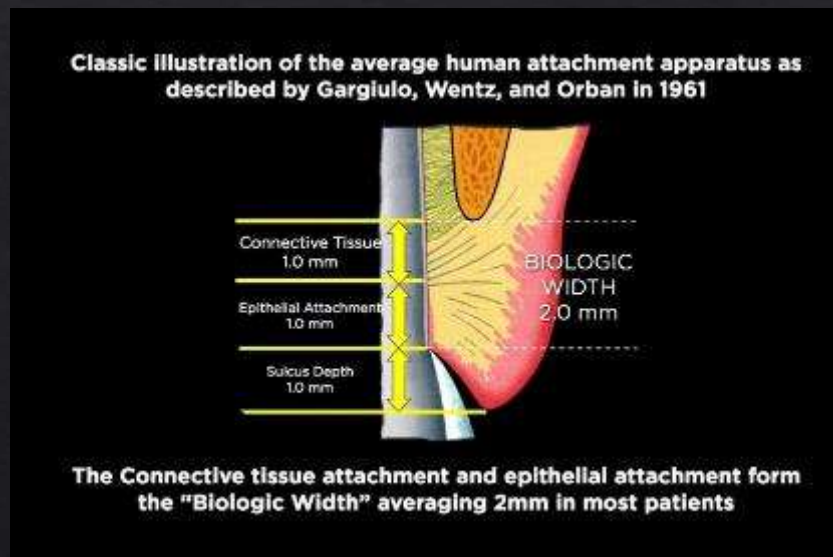
DME – Pros and Cons

ADVANTAGES

- ◊ Minimally invasive
- ◊ Tissue preservation
- ◊ Improved esthetics (select cases)

DISADVANTAGES

- ◊ Technique-sensitive
 - ◊ MUST have ability to achieve adequate isolation
- ◊ Risk of inadequate seal
- ◊ Rigorous oral hygiene ideal
- ◊ Long-term data still emerging



Restorative Material

◆ What restorative material to use?

Grubbs et al., 2020 [13]	In vitro	Marginal quality and fracture resistance	Assessed the effect of restorative material type used in DME on the marginal quality and fracture resistance of CAD/CAM fabricated onlays. A total of 75 MOD specimens prepared by CAD-CAM divided into five groups depending on the type of material used for margin elevation: (G1) type II GI, (G2) type II RMGI, (G3) RBC, (G4) BF RBC, (G5) a control with no box elevation procedure.	Restorative materials have no effect on marginal quality nor fracture resistance.
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Which Restorative Material?

Which restorative material is typically used in DME?

- A. Amalgam
- B. Composite resin
- C. Gold foil
- D. Glass ionomer

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How to Ensure Success?

What is a key component to ensure success when performing deep margin elevation?

- A. Gingivectomy
- B. Use of an amalgam core
- C. Adequate isolation using a rubber dam
- D. No use of matrix system

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What is Surgical Crown Lengthening (SCL)?

- ◇ Surgical removal of bone and/or soft tissue
- ◇ Exposes more tooth structure for restorative access
- ◇ Re-establishes biological width – apical displacement of periodontal tissues
- ◇ Wait weeks to months for master impression/scan



SCL – Indications

- ◊ Extensive caries or fractures below gingival margin
- ◊ Need to expose sound tooth structure to preserve biologic width
- ◊ Adequate periodontal support available
- ◊ Isolation not able to be achieved in current status

SCL – Pros and Cons

ADVANTAGES

- ◇ **Time-tested approach; more data available
- ◇ Enhances access and isolation
- ◇ Predictable biologic width reestablishment

DISADVANTAGES

- ◇ Esthetic compromise in anterior region
- ◇ Surgical morbidity and healing time
- ◇ Risk of root sensitivity or exposure
- ◇ Can compromise crown:root



Comparative Table

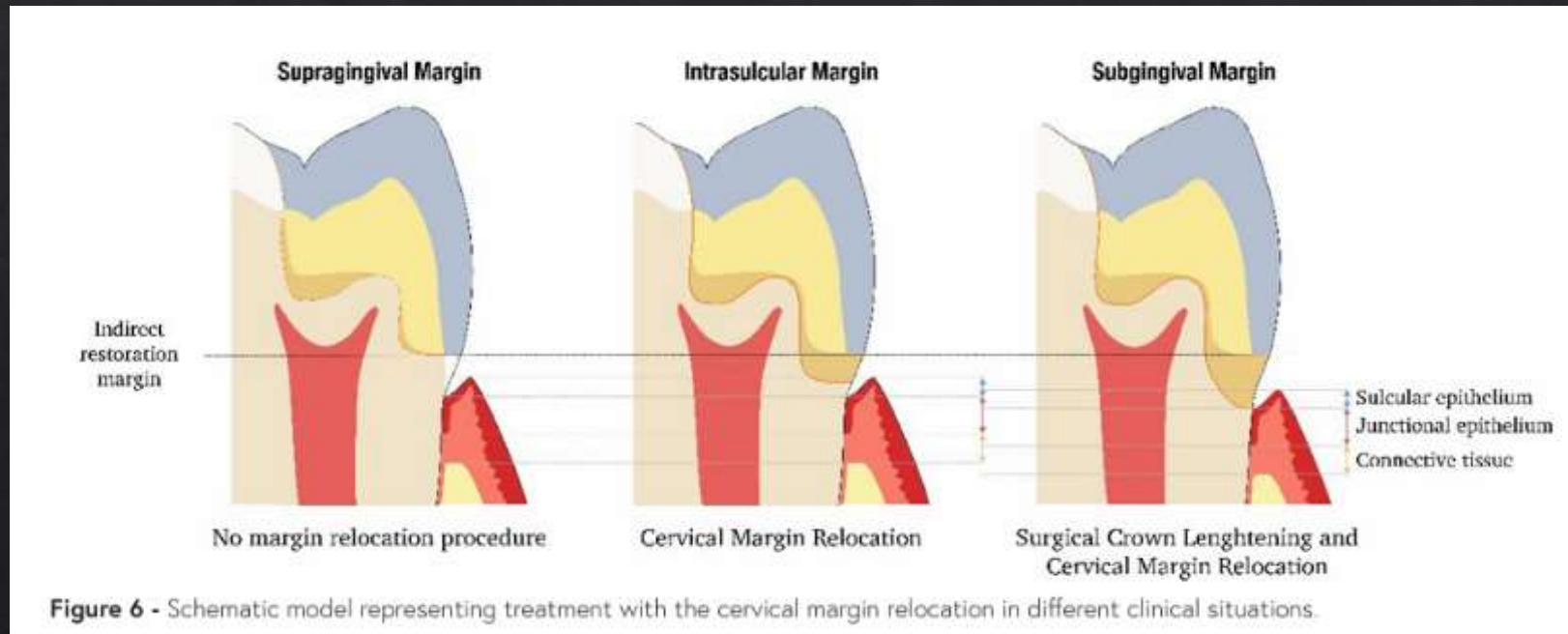
FACTOR	DME	SCL
Invasiveness	Minimal	Surgical
Esthetics	Preserved	Possible compromise
Healing Time	Immediate	Weeks to months
Cost	Lower	Higher
Technique Sensitivity	Isolation essential	May need specialist referral

Comparison

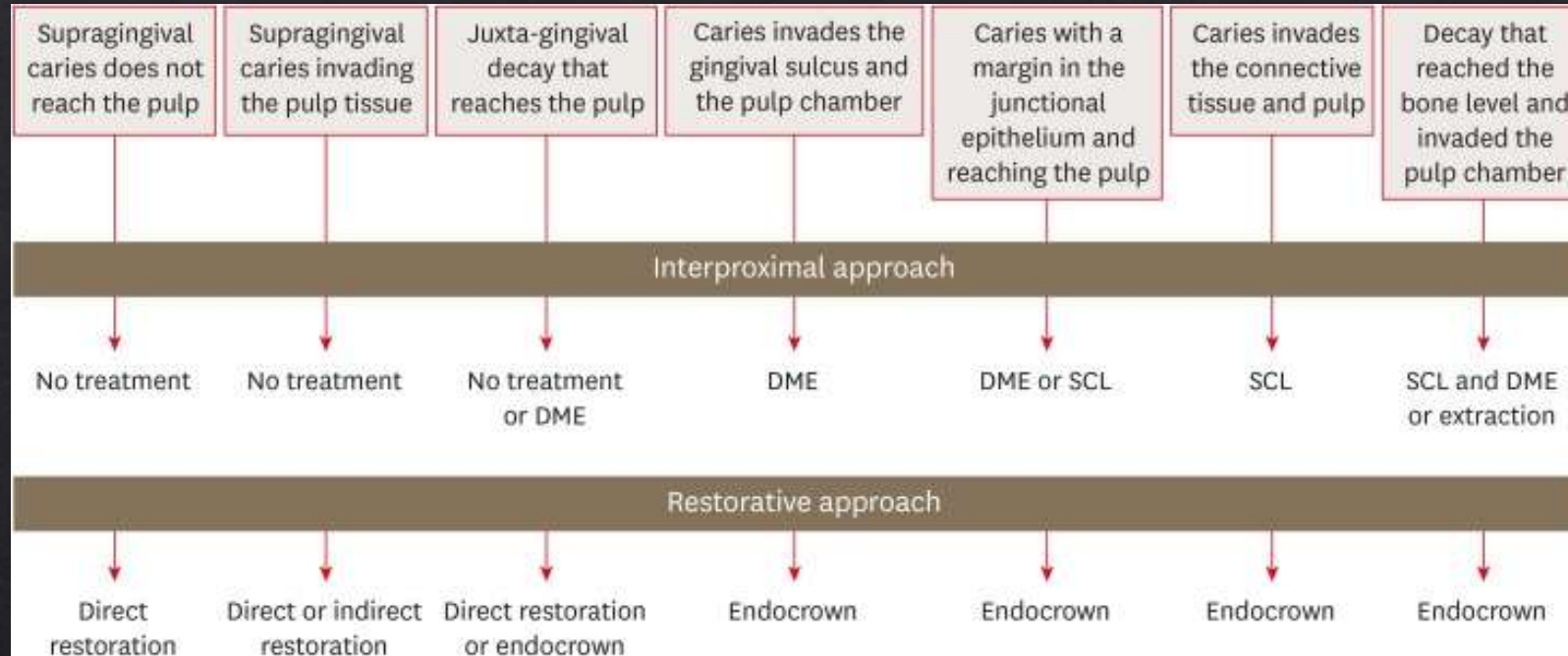
- ◇ Lack of high-quality trials comparing DME and SCL with long-term follow-up
- ◇ Lack of large sample-size RCTs available for systematic review
- ◇ 2021 systematic review comparing the two (6 studies)
 - ◇ SCL successful in long-term retention of restored teeth
 - ◇ DME had better survival ratio
 - ◇ Failure: discolored margin, fractured teeth and/or restoration, caries

Clinical Decision-Making

- ◇ Evaluate biologic width and ferrule
- ◇ Consider esthetic zone vs. posterior
- ◇ Patient preferences and medical history
- ◇ Long-term prognosis and periodontal status



Decision Tree



Dablanca-Blanco et al. (2017)

Clinical Outcomes

◇ Questions so far?

Clinical Cases



Clinical Cases



Take- Home Message

- ◊ Both techniques have valid clinical roles
- ◊ DME = Conservative, esthetic-focused, very technique sensitive
- ◊ SCL = Traditional, surgically definitive
- ◊ Tailor approach to patient and tooth-specific factors
- ◊ More research is needed!

What to Consider?

When choosing between deep margin elevation and surgical crown lengthening, what should be considered?

- A. Only anterior or posterior position of tooth
- B. Patient's insurance coverage
- C. Biologic width, esthetic zone, and patient preferences
- D. Only caries risk

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Literature

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Q&A