

Amount of tooth substance gained by crown lengthening: A SYSTEMATIC REVIEW



Presented by: Dr. Syeda Mahvash Hussain

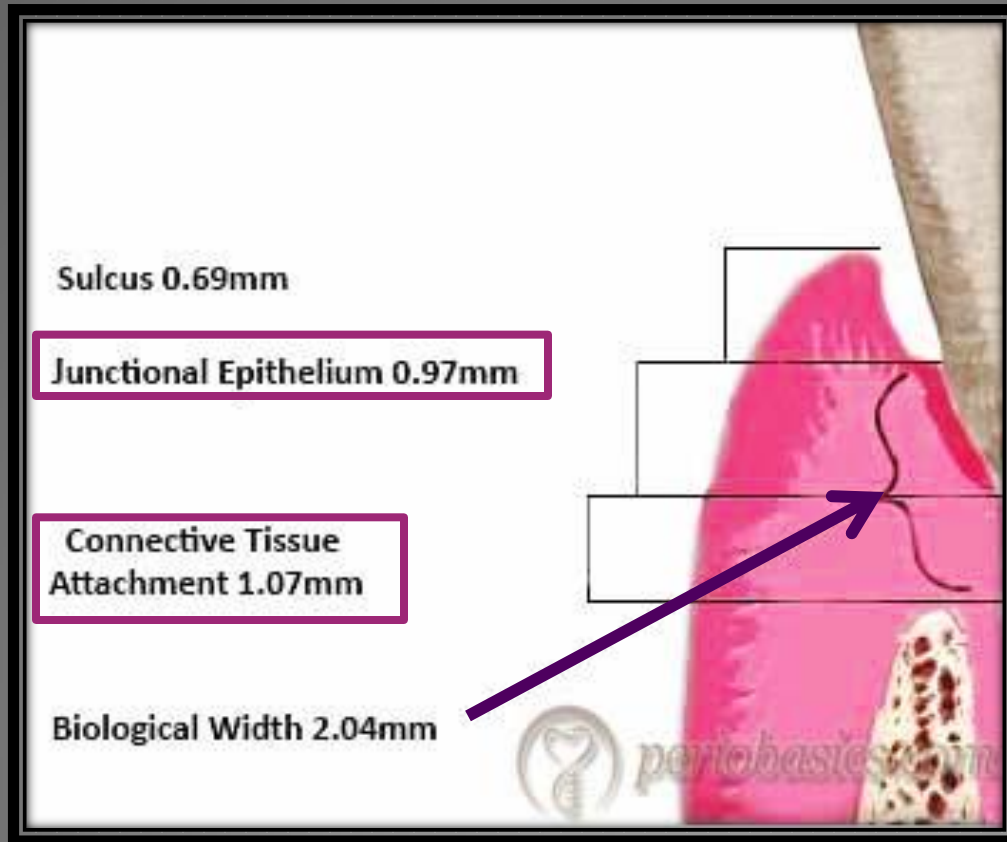
Resident Operative Dentistry

Aga Khan University Hospital Karachi

Contributors: Drs. Maham Muneeb Lone, Sana Ehsen

Supervised by: Dr. Farhan Raza Khan & Dr. Munawar Rahman

Biologic Width

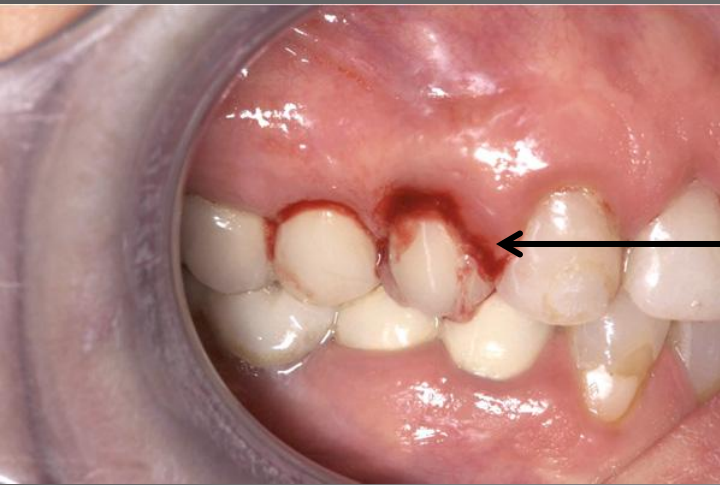


TOOTH



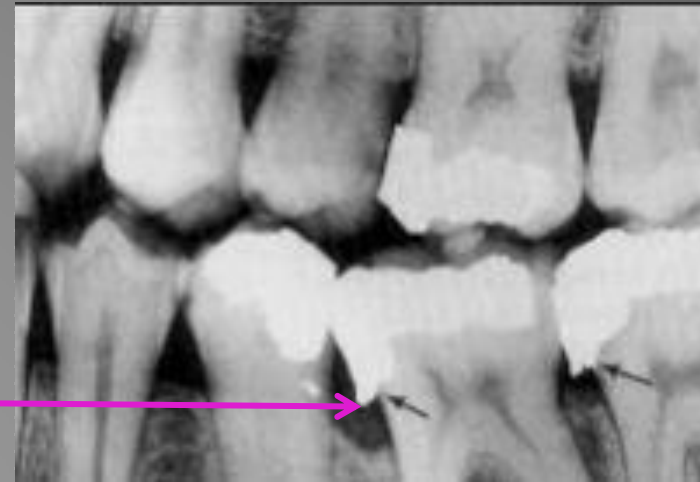
GINGIVA

Takei, HH; Azzi, RR; Han, TJ: Preparation of the Periodontium for Restorative Dentistry. In Newman, MG; Takei, HH; Carranza, FA; editors: *Carranza's Clinical Periodontology*, 9th Edition. Philadelphia: W.B. Saunders Company, 2002. page 945.

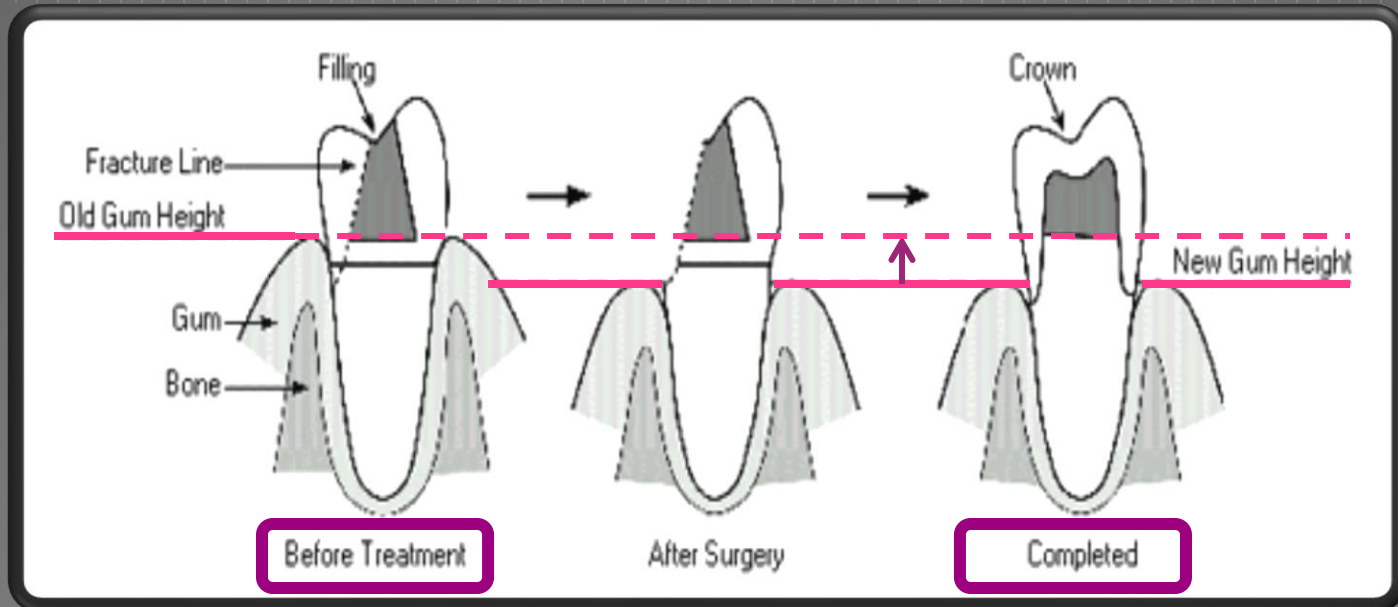


Chronic inflammation and bleeding

Loss of alveolar bone because of restoration overhang



Crown Lengthening



Indications



Sub-gingival Fracture



Inadequate ferrule



Sub-gingival Decay



Badly broken down tooth



Excessive gingival display



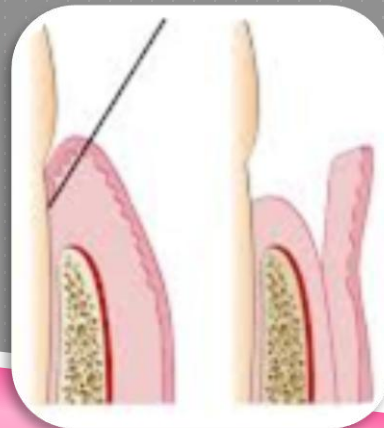
Tooth wear

Methods

- ▶ Gingivectomy/ gingivoplasty
 - ▶ Surgical blade
 - ▶ Electro cautery
 - ▶ Lasers

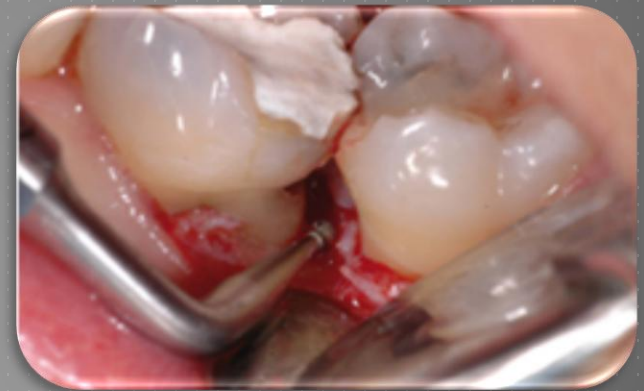


- ▶ Apical repositioning of flap
 - ▶ With osseous reduction
 - ▶ Without osseous reduction
- ▶ Orthodontic extrusion
- ▶ Combination



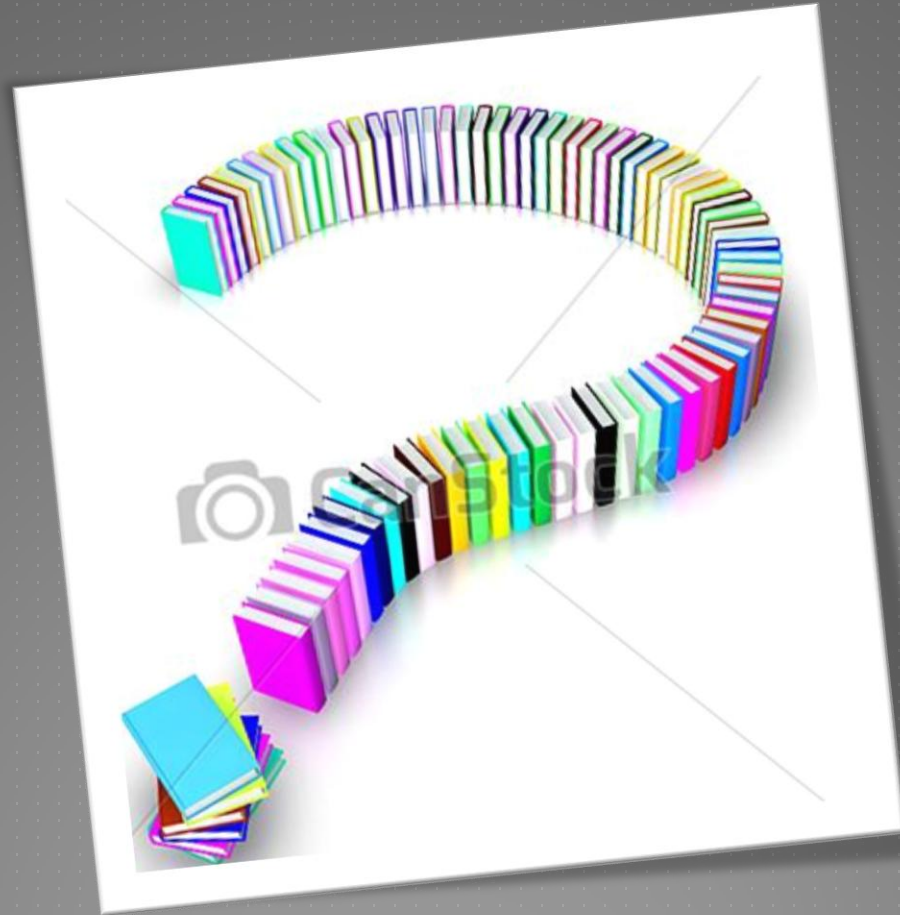
Review

- ▶ The most common technique for crown-lengthening surgery is *APF with osseous surgery*



Padbury Jr A, Eber R, Wang H-L. Interactions between the gingiva and the margin of restorations. J Clin Periodontol 2003; 30: 379–385

Review Question



Amount of tooth substance gained by crown lengthening

PICO

```
graph TD; PICO --- Outcome["Outcome(s):  
Amount of tooth structure gained"]; PICO --- Patient["Patient /population:  
Human, mature permanent teeth"]; PICO --- Comparison["Comparison of the intervention:  
Comparing the different methods"]; PICO --- Intervention["Intervention:  
Different methods of crown lengthening"];
```

Outcome(s) :
Amount of tooth structure gained

Patient /population :
Human, mature permanent teeth

Comparison of the intervention:
Comparing the different methods

Intervention:
Different methods of crown lengthening

Registration of Review



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- References and resources
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- Disclaimer



PROSPERO latest news

Evaluation of utility of PROSPERO at one year: results published
Booth A, Clarke M, Dooley G, Gherzi D, Moher D, Petticrew M, Stewart L. PROSPERO at one year: an evaluation of its utility. *Syst Rev* 2013;2:4.

Scope for eligibility expanded to include:

- Systematic reviews of reviews

Register your review protocol details

Registration is free and open to anyone undertaking systematic reviews of the effects of interventions and strategies to prevent, diagnose, treat, and monitor health conditions, for which there is a health related outcome.

Register your review when the protocol (or equivalent) has been completed but before screening studies for inclusion begins. Simply:

Registration No: CRD42014013266

Search Strategy

Literature search

- ▶ Google scholar
- ▶ PubMed(NLM)
- ▶ CINAHL Plus (Ebsco)

key terms

“Gingivectomy” or “Gingival cauterly” or “Gingivoplasty” or “Gum resection”

AND

“Tooth gain” or “Tooth exposure” or “Crown lengthening” or “ Ferrule”

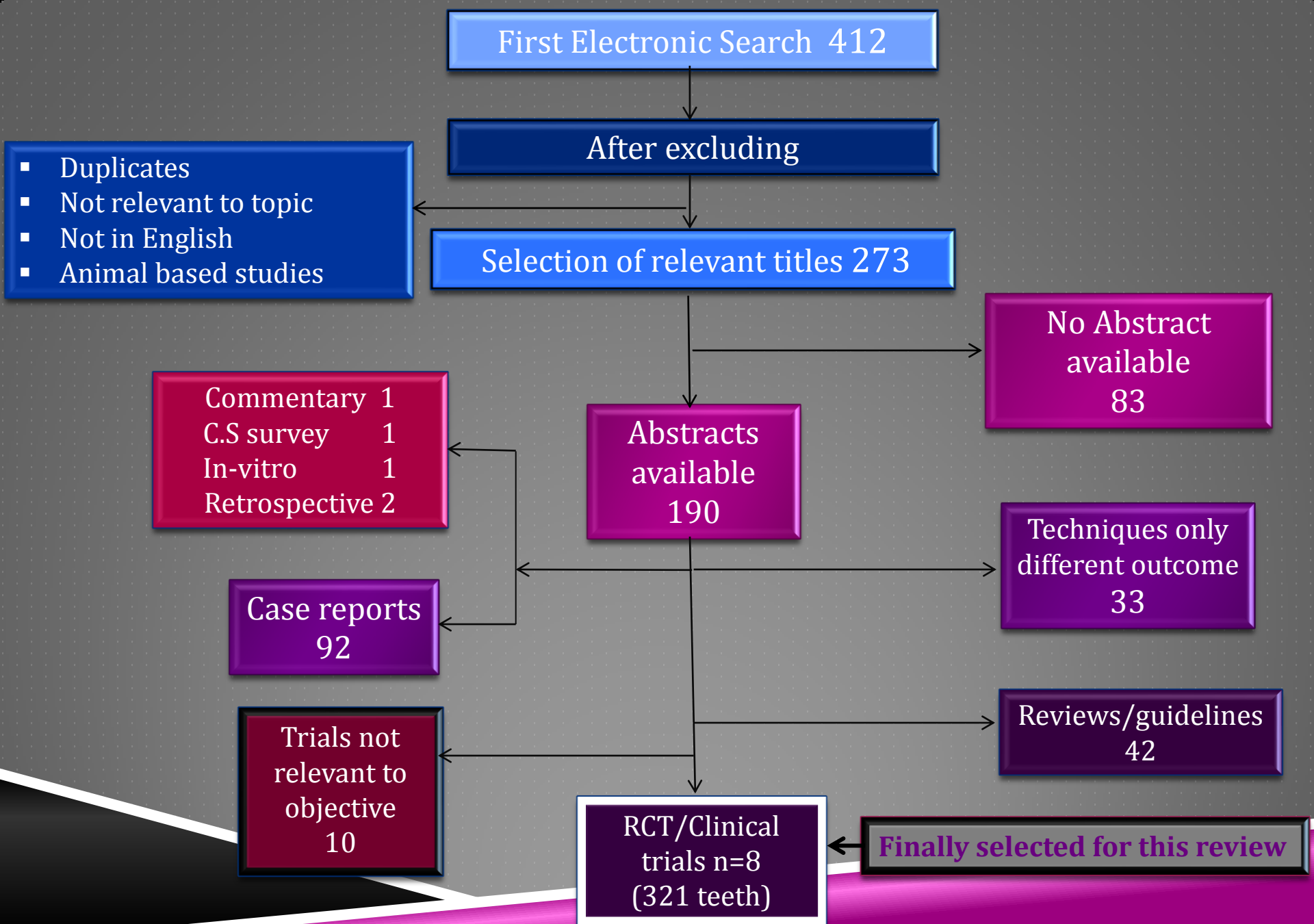
Study Selection

Inclusion Criteria:

- ▶ **Studies**-Human permanent mature teeth where **CLS** was done
- ▶ **Outcome**-Amount of tooth gained

Exclusion Criteria:

- ▶ Primary teeth
- ▶ Immature permanent teeth
- ▶ Animal based
- ▶ *In vitro* studies
- ▶ Languages other than English



DATA EXTRACTION

Data Collection Sheet

Registration No: CRD42014013266

Amount of tooth substance gained by crown lengthening

Reviewer name: _____

Paper _____

Selection or Rejection Criteria (must have all 3)

a) Method of crown lengthening used:

- a. Orthodontic extrusion Y/N
- b. Surgical (any one) Y/N
 - i. Electro-cautery/blade/Laser (gingivectomy/gingivoplasty) Y/N
 - ii. Apical repositioning of flap **with** bone reduction Y/N
 - iii. Apical repositioning of flap **without** bone reduction Y/N
 - iv. Combination of above Y/N
- c. Both Y/N

b) Outcome - Amount of tooth structure gained Y/N

Select this study? **Y/N**

If this is Y – complete the form

If N must describe why not selected:

Item #1: Clinical evaluation:

-total number of teeth assessed in the study _____ 1

-Surgical site (aesthetic or non-aesthetic zone) _____ 1

Radiographic evaluation: _____ 1

Item # 2: Characteristics of the teeth treated:

- Max or mand1
- Anterior posterior1
- Endo-treated or not1
- Tooth wear1
- Caries1
- Fracture1

Reason for crown lengthening:

- 2

Item #3: Study design: Clinical or radiographic trial/ quasi experimental / case report/ series/

others 1

Item #4: Intervention:

- No of methods used for crown lengthening:1
- Name(s) of procedure performed1
- Initial gain in tooth heightmm 1
- Endodontic treatment doneY/N
- Endodontic treatment done before or after surgical procedure:

Groups	Orthodontic extrusion	Electro-cautery/ Laser (gingivectomy/gingivoplasty)	Surgical blade	Apical repositioning of flap with bone reduction	Apical repositioning of flap without bone reduction	Combination
Yes/No						
n =						

- Were there any complications during or after the surgical procedure Y/N
- If yes, please mention:
- Time allowed for healing (months) (2)
- When was the final prosthesis deliveredY/N

Item#5 Outcome:

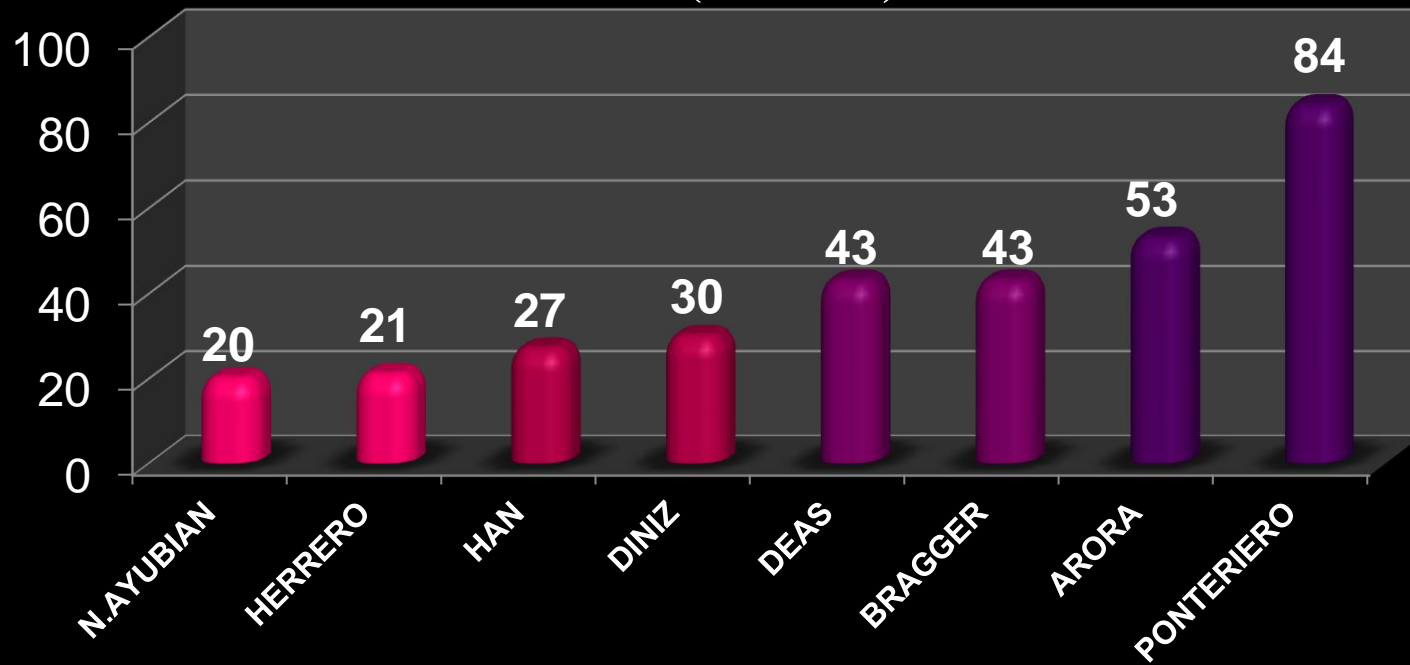
- AMOUNT OF TOOTH EXPOSED in mm (5)

TIME	ORTHODONTICS	ELECTRO-CAUTERY/ LASER	SURGICAL BLADE	APICAL REPOSITOINING OF FLAP WITH BONE REDUCTION	APICAL REPOSITOINING OF FLAP WITHOUT BONE REDUCTION	COMBINATION
INITIAL						
1 MONTH						
3 MONTHS						
6 MONTHS						
1 YEAR or MORE						

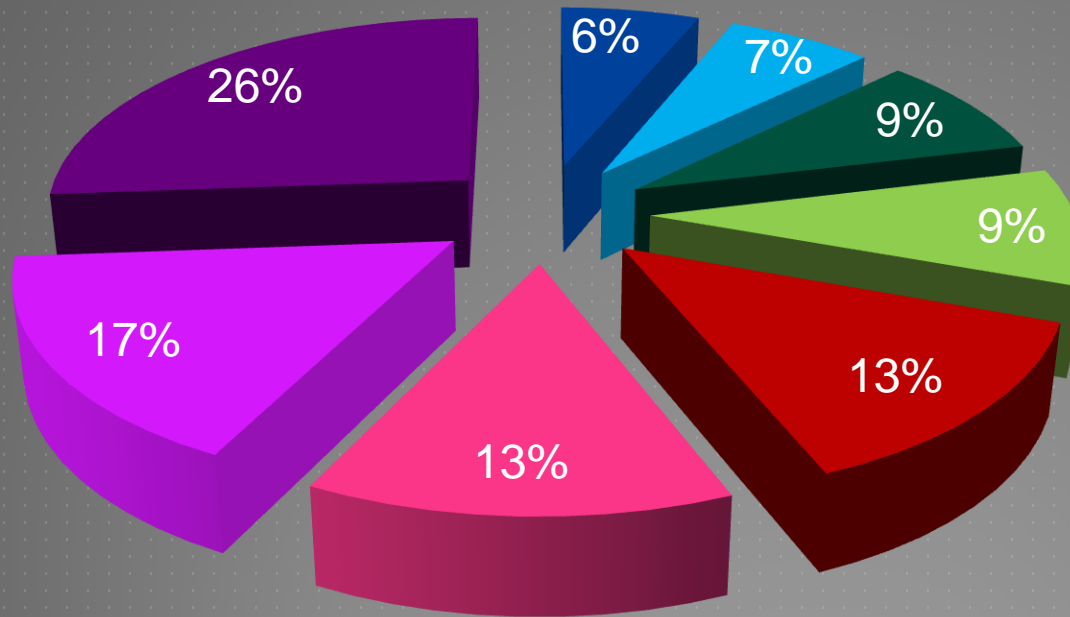
- Study Quality level Fair (till 6) Good (7-12) Excellent (13-17)



Number Of Teeth Assessed (n = 321)

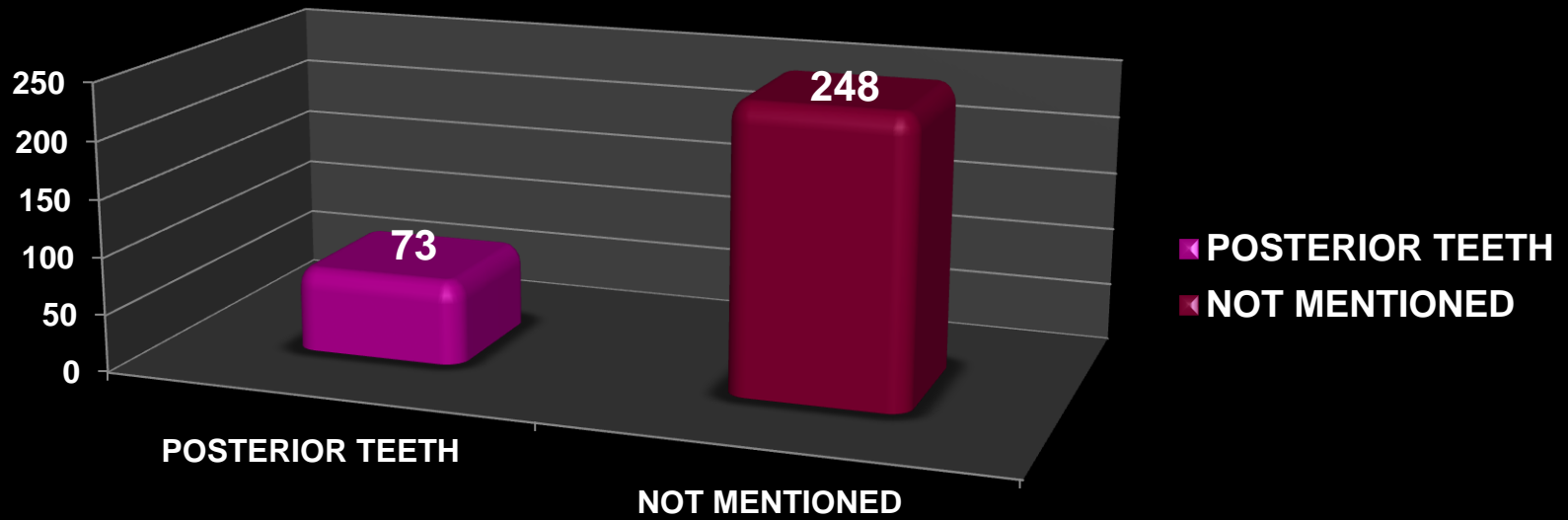


Contribution of Data By Weight

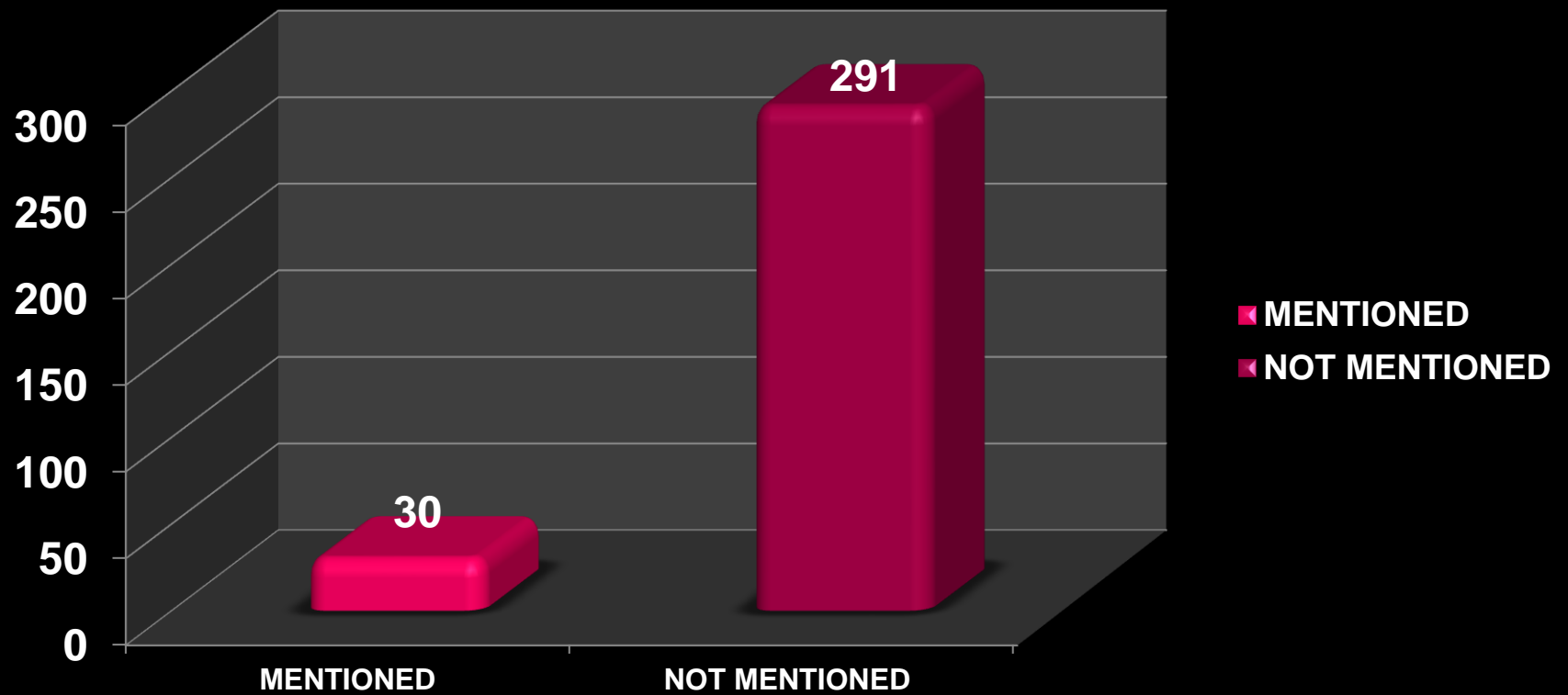


- ❖ N.AYUBIAN n=20
- ❖ HERRERO n= 21
- ❖ HAN n= 27
- ❖ DINIZ n= 30
- ❖ DEAS n= 43
- ❖ BRAGGER n= 43
- ❖ ARORA n= 53
- ❖ PONTERIERO n= 84

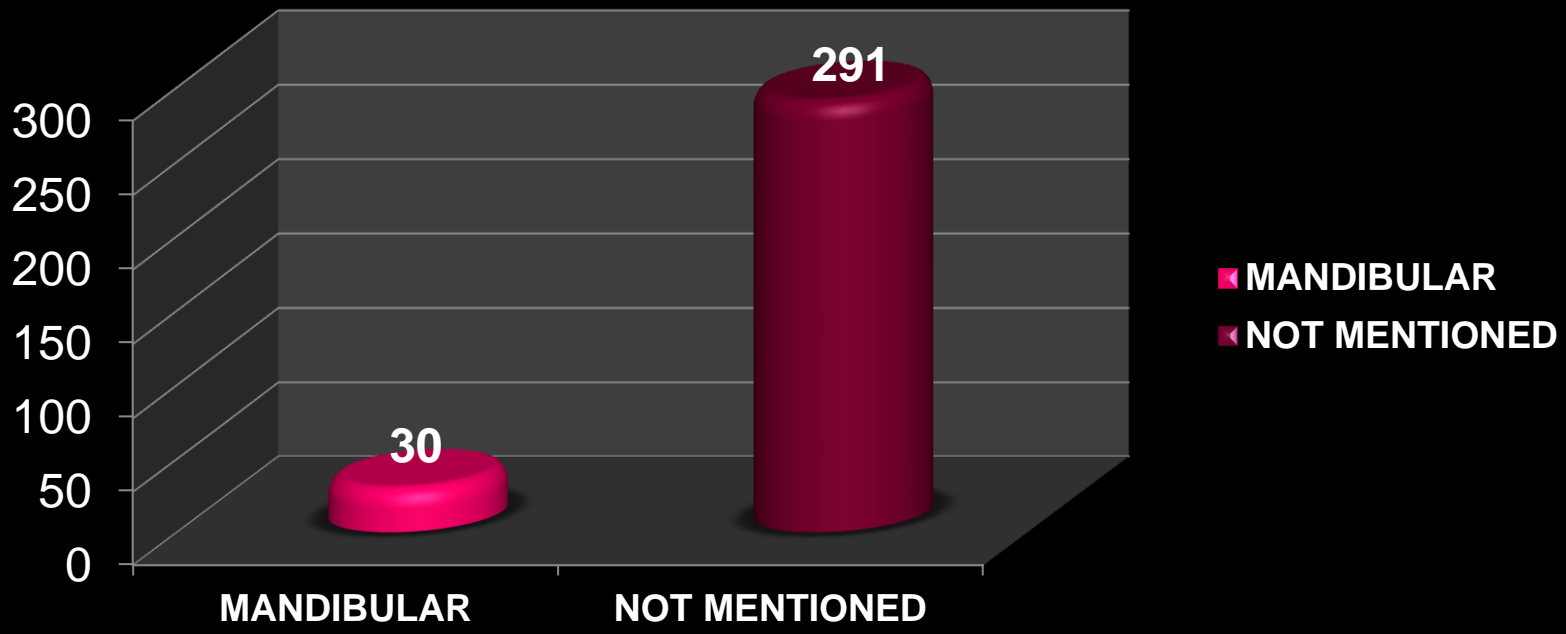
Surgical site (n = 321)



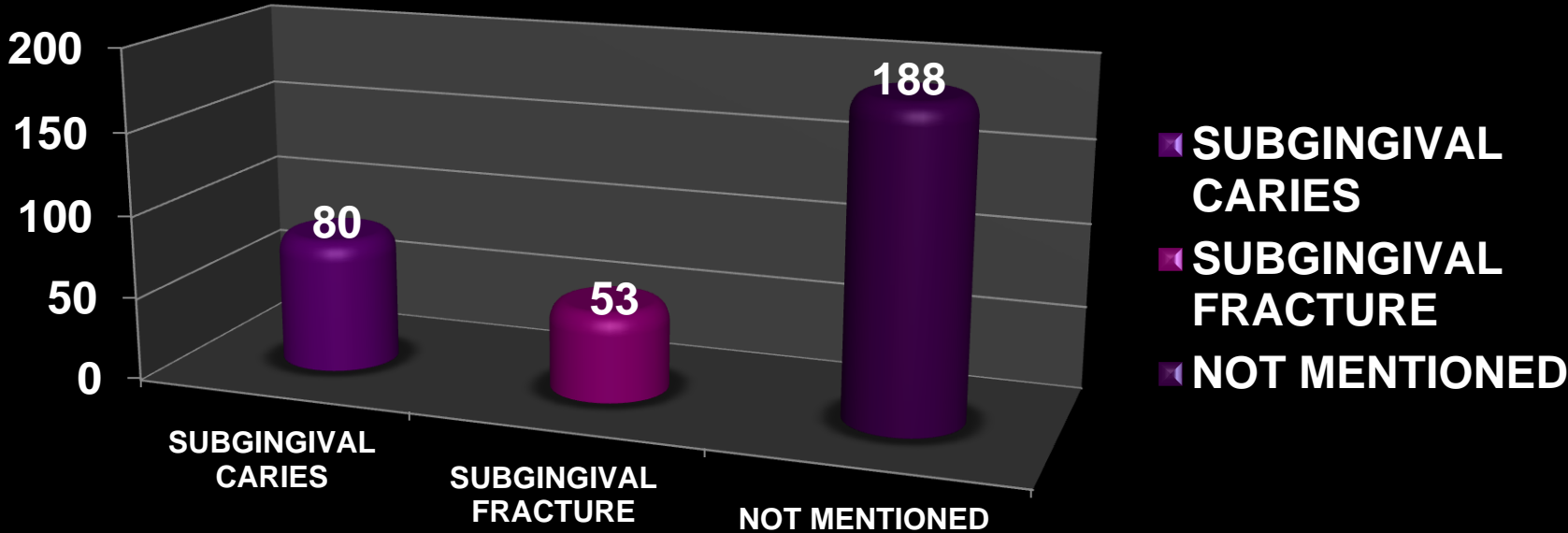
Radiographic Evaluation (n = 321)



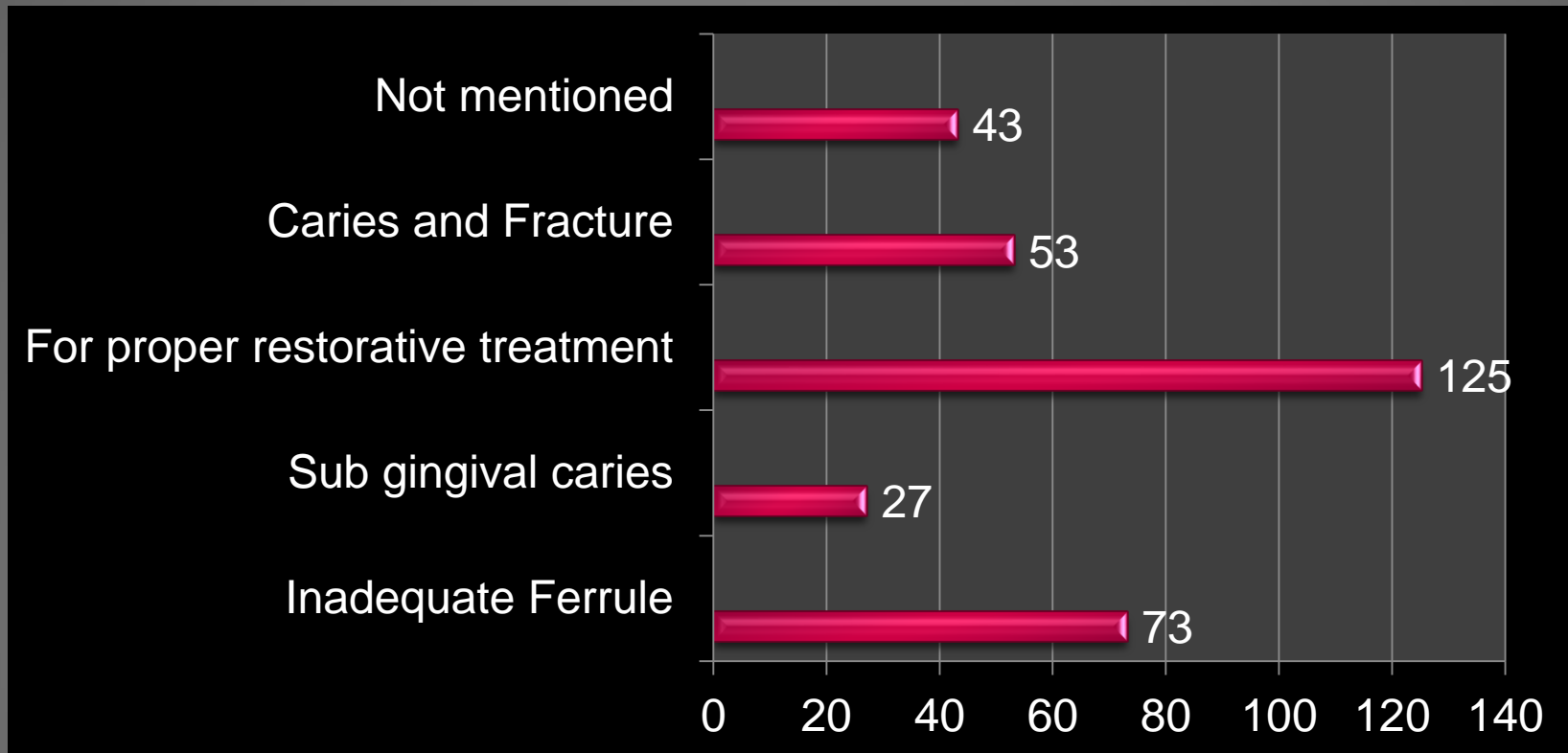
Type of Jaw (n = 321)



Clinical Presentation (n = 321)



Indication For Crown Lengthening



Tooth Structure Gained By Crown Lengthening

Follow up of CLS	Number of teeth	Minimum (mm)	Maximum (mm)	Mean (mm)	Std. Deviation
Amount of tooth structure gained Initially with APF and bone reduction	300	1.32	4.00	2.46	1.03
Amount of tooth structure gained in 3 months with APF and bone reduction	146	1.60	1.87	1.75	0.13
Amount of tooth structure gained in 6 months with APF and bone reduction	196	1.00	1.80	1.49	0.32

AUTHOR	TITLE	SEARCH STRATEGY	SUMMARY
Hempton T.J et al 2010	Contemporary crown lengthening therapy A REVIEW	<ul style="list-style-type: none"> • <u>Pub med</u> • <u>Google scholar</u> 	<ul style="list-style-type: none"> • Methods of CLS
Sharma A et al 2012	Short clinical crowns (SCC) – treatment considerations and techniques A REVIEW	<ul style="list-style-type: none"> • <u>Pub med</u> 	<ul style="list-style-type: none"> • Methods for CLS • The role of restoration margin location • Effects of violation of the supracrestal gingivae
AKUH 2014	Amount of tooth substance gained with crown lengthening – A SYSTEMATIC REVIEW	<ul style="list-style-type: none"> • Pub med • Google scholar • CINAHL plus (Ebsco) 	<p>Identified the characteristics of the relevant studies:</p> <ul style="list-style-type: none"> • Most commonly used method for CLS • Type of study • Amount of tooth substance gained • Year of Publication



CONCLUSIONS

- ▶ The number of clinical trials on CLS were limited
n = 8 (321 teeth)
- ▶ The quality of the studies which report data on CL was mostly inadequate
- ▶ APF with bone reduction was the most commonly used technique (7/8 studies) for CLS
- ▶ The mean amount of tooth structure gained initially was 2.46mm which decreased to 1.49mm after 6months



Strengths and Limitations

STRENGTHS

- ▶ The first ever Systematic review on this topic

LIMITATIONS

- ▶ Only three search engines were used
- ▶ Studies lacked homogeneity in reporting the outcome
- ▶ Only experimental studies were included

RECOMMENDATIONS

- ▶ Explore more data through other search engines to expand existing research
- ▶ More clinical trials are needed to answer the research question



THANK YOU!