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# Tissue Management for Indirect Restorations Using Gingival Retraction Systems

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# OKU Sutro Excellence Day Project Cover Sheet

## Project Title

Tissue Management for Indirect Restorations Using Gingival Retraction Systems

## Full name(s) and class year(s) of all project collaborators

*Example: Jane Smith, DDS 2022; John Smith, DDS 2022*

Summer Youssef, IDS25; Punyatoya Parichha, IDS25; Asmaa Elbegirmy, IDS25

## Project Category

IDS - 1st Year Literature Review

## Enter your abstract text here (max 300 words)

Abstract:

Objectives: The objective of this study is to compare the effectiveness of different gingival retraction systems, including cords, paste, and laser, for creating adequate gingival retraction in preparation for indirect restorations.

Methods: A comprehensive review of the literature was conducted to gather relevant studies and clinical trials comparing the use of cords, paste, and laser for gingival retraction. Various databases including PubMed, Cochrane Library, and Google Scholar were searched. Studies were included based on their relevance to the topic and their methodological rigor.

Results: The review revealed that each gingival retraction system has its own advantages and limitations. Traditional cord techniques offer effective tissue displacement but may cause discomfort to patients and require meticulous handling. Gingival retraction pastes provide a convenient and less invasive alternative but may not achieve adequate retraction in all cases. Laser-assisted gingival retraction offers precise tissue management with minimal discomfort, although equipment costs and operator expertise are significant considerations.

Conclusions: The choice of gingival retraction system should be based on the specific clinical scenario, patient preferences, and practitioner expertise. While traditional cord techniques remain widely used and effective, newer methods such as gingival retraction pastes and laser-assisted techniques offer promising alternatives with their own unique benefits. Further research is needed to explore long-term outcomes and patient satisfaction with these different approaches.

Acknowledgements: The authors would like to acknowledge the contributions of all researchers and clinicians whose work has contributed to the understanding of gingival retraction systems. Additionally, the authors express gratitude to the participants of the included studies whose participation made this review possible.

# Tissue Management for Indirect Restorations Using Gingival Retraction Systems

**Summer Youssef, Punyatoya Parichha, Asmaa Elbegirmy, Dr. Jim Milani**
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## OBJECTIVE

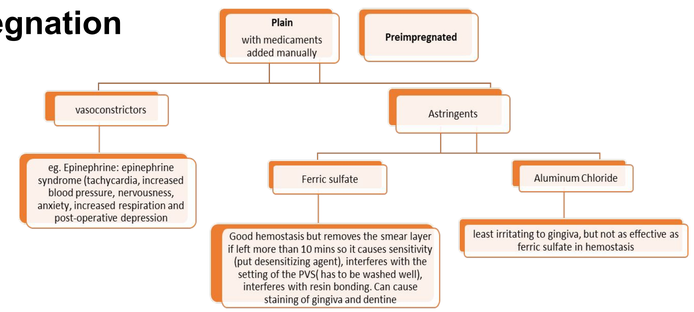
The objective of this study is to compare the effectiveness of different gingival retraction systems, including cords, paste, and laser, for creating adequate gingival retraction in preparation for indirect restorations.

## METHODS

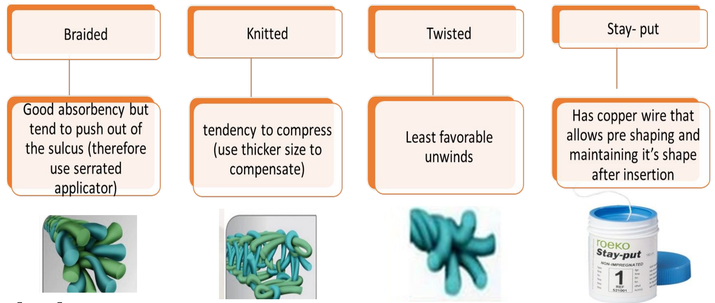
A comprehensive review of the literature was conducted to gather relevant studies and clinical trials comparing the use of cords, paste, and laser for gingival retraction. Various databases including PubMed, Cochrane Library, and Google Scholar were searched. Studies were included based on their relevance to the topic and their methodological rigor.

## Cords

### Impregnation




### Fabrication




### Technique


Advantages:

- Produces greater gingival displacement in comparison to paste.
- Greater cost efficiency compared to other methods.

Disadvantages:

- Time consuming.
- Causes gingival inflammation on a histological level.
- Can cause gingival bleeding upon removal.
- Can interfere with the setting of PVS.
- Can cause sensitivity due to removal of smear layer when used with ferric sulfate or aluminum chloride.
- Can cause staining of gingiva or dentine when using ferric sulfate.

## Cordless Retraction Methods

- To avoid gingival tissue damage and inflammation due to retraction cord and to avoid systemic effects of hemostatic medicament cordless retraction methods are gaining popularity.
- Cordless displacement generates significantly less pressure (143 KPa) when compared to displacement cords (5396 KPa) resulting in less tissue damage and injury to the crevicular epithelium, the junctional epithelium and the supra-alveolar connective tissue fibers.
- Cordless displacement material such as pastes, foam or gel have the advantage of being non-traumatic to the gingival tissue during placement, leaving no residue, being easy to use and time saving.

## Expasyl Paste

- Expasyl, a clay like material (kaolin) containing an astringent (aluminum chloride) is the 1st to market and commonly used retraction paste to expand the sulcular tissue laterally and concurrently provide hemostasis.
- Expasyl system includes an injectable material supplied in a cartridge and delivered with a specifically designed gun. It is easy to dispense and remove system which effectively achieves hemostasis.
- When injected into the sulcus aids to mechanically displace the gingival tissues to open the sulcular space, effectively providing space for impression material to flow. While at the same time the aluminium chloride act as a hemostatic agent.

Prepared tooth for Expasyl application

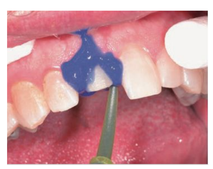
Expasyl application for 2 mins to obtain a clear exact sulcular opening

Rinse of Expasyl results in a distinct sulcular opening

## Magic FoamCord

- Magic Foam Cord is a new non-hemostatic gingival retraction system.
- It is the 1st expanding vinyl polysiloxane material designed for retraction of the gingival sulcus without the potential trauma to sulcus.
- It is easier to use as it flows directly into sulcus without causing trauma and a more efficient system for multiple preparations .

Prepared tooth



Injection of expanding polymeric foam around the preparation

Patient closes on cotton role to maintain pressure for 5 mins

Tissue displaced from preparation margins

## Laser

Lasers are based on a high-powered focused beam operating by photo-ablation that causes tissue vaporization at 100-150 °C, inciseing tissue without hemorrhage, by fast wound healing with no inflammation or pain.

- Diode laser produced greater mean lateral gingival displacement than magic foam cord, and retraction cord impregnated with aluminum chloride.
- Diode laser was the fastest gingival retraction system compared to magic foam cord and retraction cord.
- Gingival recession was comparable but no clinically significant differences were reported compared to the double-cord technique impregnated with aluminum chloride cords and diode laser 8 weeks after cementation.

## SUMMARY

The review revealed that each gingival retraction system has its own advantages and limitations. Traditional cord techniques offer effective tissue displacement but may cause discomfort to patients and require meticulous handling. Gingival retraction pastes provide a convenient and less invasive alternative but may not achieve adequate retraction in all cases. Laser-assisted gingival retraction offers precise tissue management with minimal discomfort, although equipment costs and operator expertise are significant considerations.

## CONCLUSION

The choice of gingival retraction system should be based on the specific clinical scenario, patient preferences, and practitioner expertise. While traditional cord techniques remain widely used and effective, newer methods such as gingival retraction pastes and laser-assisted techniques offer promising alternatives with their own unique benefits. Further research is needed to explore long-term outcomes and patient satisfaction with these different approaches.

| | CORD | PASTE | LASER |
|---|---|---|---|
| Amount of Gingival Displacement | ++ | + | +++ |
| Rate of Rebound | ++ | +++ | + |
| Effect on the Gingiva | ++ | + | ++ |
| Patient Comfort | + | ++ | +++ |
| Time Efficency | + | ++ | +++ |
| Cost | +++ | ++ | + |

## REFERENCES

The authors would like to acknowledge the contributions of all researchers and clinicians whose work has contributed to the understanding of gingival retraction systems. Additionally, the authors express gratitude to the participants of the included studies whose participation made this review possible.