
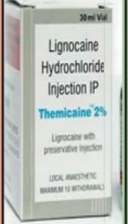



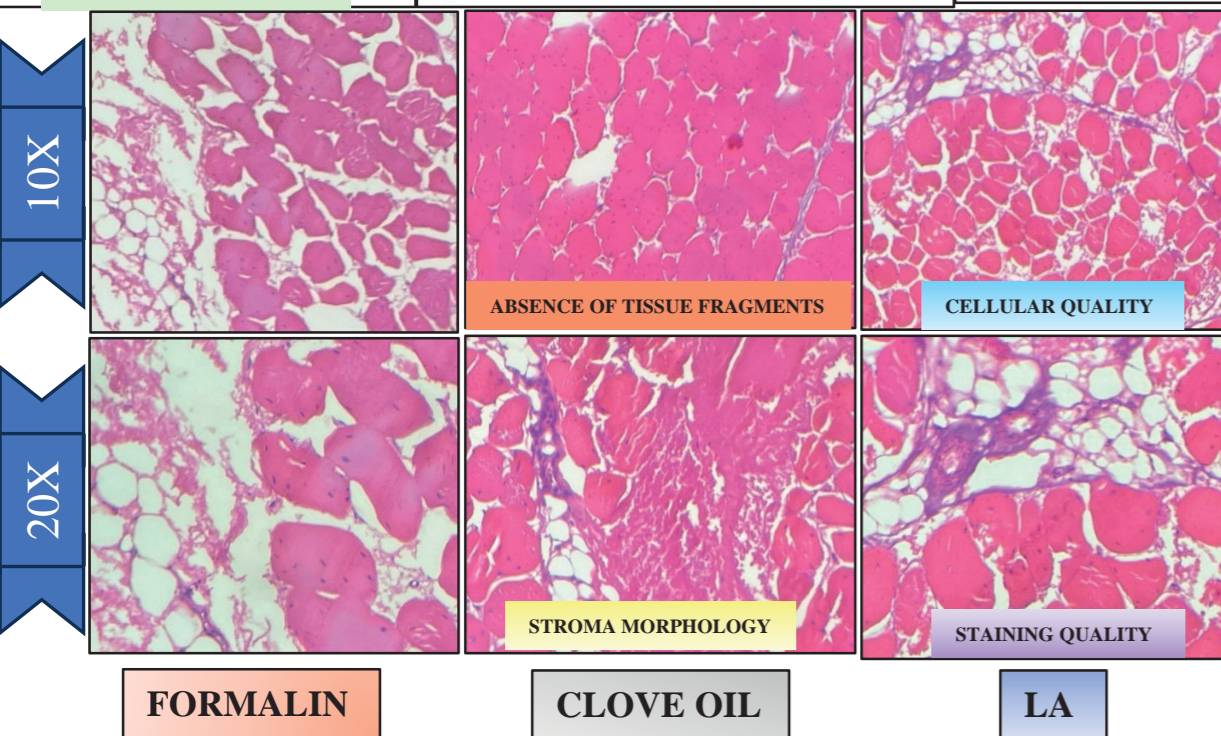
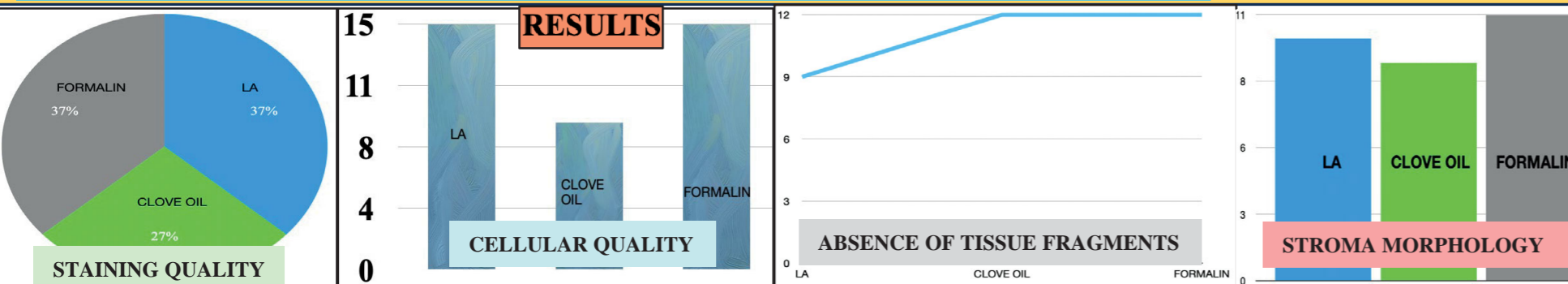
**INTRODUCTION:-** Formalin, routinely used tissue fixative in laboratories, is carcinogenic and not readily available in dental practices, creating a need for **accessible chairside tissue fixatives**. Previous studies have explored **local anaesthetic solution (LA)** as a transit fixative. Given that **clove oil** is readily available in dental practices in form of eugenol and has similar pharmacological properties to LA, we conducted this **pioneer study** to test and compare the effectiveness of clove oil with LA and formalin as tissue fixatives.

**AIM :-** To compare the efficacy of clove oil with LA & 10% neutral-buffered formalin as tissue fixative.

**METHODOLOGY :-** This study was conducted using commercially available **fresh chicken samples**, 21 tissues (seven per solution) measuring 1 cm<sup>3</sup>. After placing tissues in each solution at **room temperature(25°C)** for **24 hours**, followed by routine processing and H&E staining, **qualitative assessment** was made by 2 blinded oral pathologists under a compound microscope. The criteria used for assessment were (a) **staining quality** (b) **cellular quality** (c) **absence of tissue fragments** (d) **stroma morphology**. The scale method used for grading was Poor- 1, Good- 2, Excellent- 3 with a range of 7-21. Using this scale, 21 tissues were evaluated based on the mentioned properties & their average scores were then calculated

|                                                                                     |                                                 |                                                                                     |                                                                      |                                                                                     |                                                               |
|-------------------------------------------------------------------------------------|-------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------|
|  | Penetration Rate<br>Cross-Linking<br>Osmolarity |  | Vasoconstrictor<br>Osmolarity<br>Buffering Capacity<br>Preservatives |  | Antimicrobial<br>Phenolic Content<br>Dehydration<br>Viscosity |
|-------------------------------------------------------------------------------------|-------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------|

**DISCUSSION:-** Until our study, clove oil, which shares similar properties with LA (analgesic, anaesthetic), had not been assessed as a tissue fixative. Our findings showed that after 24 fixation, **clove oil provides minimal tissue fragmentation & better stroma morphology comparable to formalin**, likely due to eugenol's preservative qualities that stabilize tissue by cross-linking proteins & biomolecules. **Since formalin penetrates tissue at roughly 1 mm per hour, clove oil is likely to have a similar penetration rate.** Clove oil shows promise as an alternative fixative agent, but a notable drawback is its potential to cause tissue irritation



| AUTHOR                  | YEAR | COUNTRY      | SAMPLE SIZE   | TYPE OF SAMPLES   | OBSERVATIONS                                                                                                       |
|-------------------------|------|--------------|---------------|-------------------|--------------------------------------------------------------------------------------------------------------------|
| Rajanikanth M et al.    | 2015 | India        | Multiple bits | Goat tongue       | LA as good transit media.                                                                                          |
| Aroonwan Lamubol et al. | 2018 | Bangkok      | 40            | Oral soft tissues | LA - not recommended as a transport agent                                                                          |
| Sowmya Kasetty et al.   | 2018 | Saudi Arabia | 40            | Goat tongue       | LA can be used as an emergency fixative                                                                            |
| <b>PRESENT STUDY</b>    | 2024 | India        | 21            | Chicken breast    | <b>LA - staining and cellular quality &amp; in clove oil- absence of tissue fragments - comparable to formalin</b> |

**CONCLUSION & FUTURE PROSPECTS:-** As chairside availability of tissue fixatives is the call of the day, in our **pioneer attempt** we found that clove oil i.e. Eugenol in dental practice, because of the above mentioned properties, could prove to be a **promising fixative** in the future that requires further verification from studies on human tissues (ongoing). **Future studies could investigate clove oil for fixing and preserving smaller biopsy samples, its compatibility with various staining techniques, and immunohistochemical protocols.** As research progresses, clove oil may play an increasing role in histopathology and immunohistochemistry.

**REFERENCES:-** 1.Kasetty S, Dwivedi D, Ragavendra TR, Kallianpur S, Gupta S, Prabhakar N. Comparison of efficacy of local anesthetic solution, distilled water and normal saline as emergency fixatives. J Oral and Maxillofac Pathol 2018;22:283-4  
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