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Comparing the pain-relieving efficacy of transdermal diclofenac patch versus transdermal methyl salicylate patch after performing surgical extraction of first, second and third molars post operatively in mandibular quadrants

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Abstract
Surgical extraction is a procedure which is undertaken for the extraction of teeth which cannot be extracted with simple forceps, elevators or luxators.
This can be determined pre operatively by examining with pre-operative radiographs or it can be determined even amidst the procedure when it becomes impossible to extract a tooth after all the possible methods and expertise.
Introduction: Surgical extraction is a feasible procedure that can be taken place in the dental clinic under local anesthesia [1], but the prevalence of patient compliance factor about intake of oral medications is not always 100% though directed by the physician in a greater manner.
Besides this, another factor is the adverse effects of oral ingestion of Non-steroidal anti-inflammatory drugs [2] suggest the need to look for an alternative similarly efficient but lesser adverse effects giving medication to relieve pain.
Methods: This is a randomised controlled split mouth trial where 80 patients were randomly selected based on their needs of extraction of firm teeth in the mandibular quadrants with respect to first, second and third molars.
Result: Methyl salicylate is slightly better than diclofenac sodium in relieving moderate to extreme pain.
Conclusion: Study showed promising results in relieving moderate to extreme pain control after performing surgical extraction in the mandibular posterior quadrant.

Keywords: transdermal patch, surgical extraction, pain relief, post extraction

Introduction
Surgical extraction is done with teeth which are not getting extracted by the means of the non-surgical extraction techniques There can be various reasons to why this happens [3].
The simple answer can be fracture of a root or a piece of root Besides the very obvious reasons that can be seen on the pre-operative radiographs can be dilacerated roots, bulbous roots, malalignment of the tooth, malformed morphology, etc.
Whichever reason it may carry there is often more unpleasant pain accompanied when a surgical extraction procedure takes place of a simple extraction procedure.
In today's world there are various techniques to relieve pain [4] Not necessary by administering orally, Sub cutaneous, Intra venous, etc. medications.
Today it is not even important to take allopathy medications for relieving mild to moderate pain.
To relieve pain by taking medications can be as compliant and easy as to apply transdermal patches [5]. These can be working systemically or working locally. There is overuse and abuse of the pain-relieving medications [6] available in the market may it be opioids or Non-steroidal anti-inflammatory drugs.
In this era where the population is not aware of whether science is a curse or a boon, it is necessary to limit the adverse effects and dependency of a patient on pain killers [7].
It can be done by using trans dermal patches [8] which establish the purpose of not overusing and only necessary using of the drugs available in the market. This is in turn going to give a better standard of living to the society.

Inclusion Criteria
Both the genders Age 20 to 50 Patients undergoing surgical extraction in the mandibular first second and third molars

Exclusion Criteria
Local inflammation Local pathology Local carcinoma Patients on pain threshold lowering drugs Use of tobacco in any form immunocompromised individuals Pregnant women Patients with hereditary blood conditions

Methods
80 patients randomly were selected from the departmental OPD in the oral and maxillofacial surgery in R.K.D.F. Dental college and Research centre, Bhopal, M.P. who underwent the process surgical extraction in the mandibular first second and third molars Pain after surgical extraction procedure in the same patient was alternatively relieved by using transdermal methyl salicylate patch and transdermal diclofenac patch Each patient was given visual analogue scale to evaluate the effectiveness of the medications Thereafter, the patient was observed 8 and 12 hours post operatively respectively After thoroughly taking patient history, the procedure was performed on the patients with a carbide bur, sutures were given and patients were recalled after 7 days At first the transdermal diclofenac sodium patch was applied on the inner forearm [9] and changed after 12

hours, once.
At the time of the next recall, the other anterior half of the maxilla was operated and this time the next transdermal methyl salicylate patch was applied on the lateral surface of the neck [10] and was changed after 8 hours twice. The patient was observed after 8 and 12 hours for the relieve of pain after application of each patch on VAS visual analogue scale

Statistical Analysis
Given below.

Results
Both the transdermal patches show similar pain-relieving effects at the 8th hour but Methyl Salicylate transdermal patch is slightly more effective than the Diclofenac Sodium transdermal patch at the 12th hour

Conclusion
Transdermal drug delivery system stands effective in relieving moderate to extreme pain after surgical extraction with both the patches showing efficacy in providing pain relief

Discussion
Patients suffering from organ disorders are not likely to get results the way doctors have advised and the pattern of drugs intake which is not as designed. Transdermal patches came into existence in late 1970s known as trans dermal drug delivery system [11].
These are dosage form designed to deliver a therapeutically effective amount of drug across a patient's skin [12]. This, not only provides controlled and constant administration of the drug [13] but also allows continuous input of drugs with short biological half-lives and eliminates pulsed entry into systemic circulation.
Administration of therapeutic agents normally used in surgical extraction go through the first pass metabolism but, methods used across the skin enables drugs to avoid first-pass chemical or enzymatic degradation in the gastrointestinal tract. There are a variety of patches used for trans dermal delivery namely: reservoir patches, matrix patches, drugs in adhesives and micro reservoir system [14]. Matrix patches can be applied to the skin by either gluing the backing to the skin adjacent to the matrix or an adhesive on the matrix to the skin [15].
Other than the normal out patients in the department, the candidates selected for the delivery of the application of the patches can be the ones who are not aware of the importance of administering medications like the especially abled ones. The other candidates can be one inform the doctor that they are most likely to skip medications and cannot necessarily be regular with their doses. One category can be the medically affected patients facing conditions like gastritis, etc. who are relatively or absolutely contraindicated to administer Non-steroidal anti-inflammatory drugs orally.

Table 1: Intergroup Comparison Between Two Groups At 8hrs

	Immediate Post Op	Pain at 8hrs	Mean Red in Pain	Percentage Reduction in Pain	P value	Significance
Diclofenac Sodium	7.00±1.15	4.80±0.42	2.20±1.03	30.13±10.26	0.014	Significant
Methyl Salicylate	6.40±0.84	3.50±0.52	2.90±1.10	44.20±12.59		

Mann Whitney U test at p≤0.05

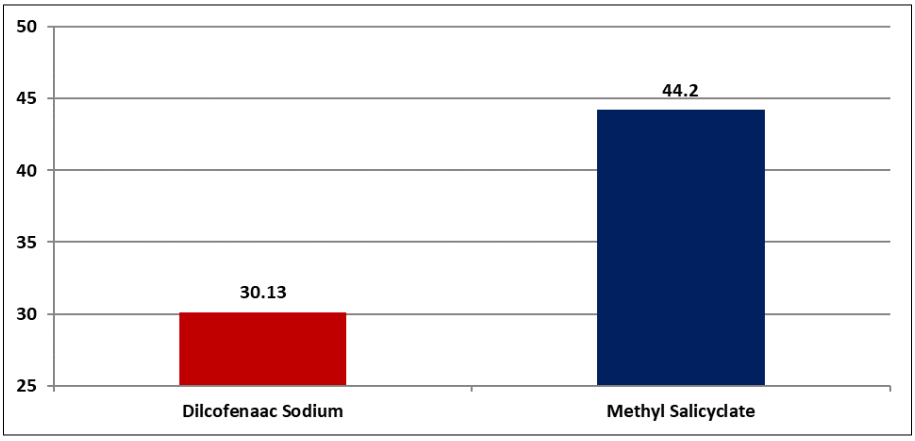

Fig 1

Table 2: Intergroup Comparison between Two Groups at 12 Hrs

	Immediate Post Op	Pain at 12hrs	Mean Reduction in Pain	Percentage Reduction in Pain	P value	Significance
Diclofenac Sodium	7.00±1.15	2.20±0.63	4.80±1.47	67.25±12.65	0.323	Non-Significant
Methyl Salicylate	6.40±0.84	1.80±0.42	4.60±0.84	71.59±7.41		

Mann Whitney U test at p≤0.05

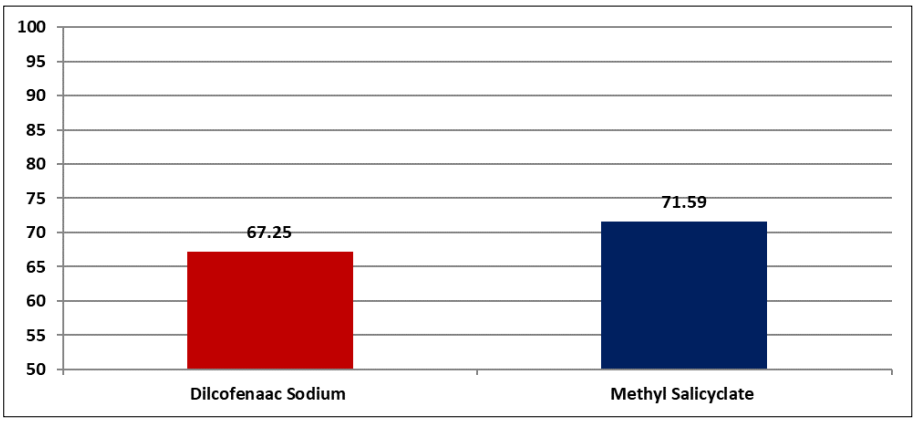

Fig 2

Table 3: Intragroup Compariosn of Pain Scores

	Immediate Post Op	Pain at 8hrs	Pain at 12 hrs	P value	P value
Diclofenac Sodium	7.00±1.15	4.80±0.42	2.20±0.63	0.001	Significant
Methyl Salicylate	6.40±0.84	4.00±0.81	0.80±0.42	0.001	Significant

Repeated Measures ANOVA test at p≤0.05

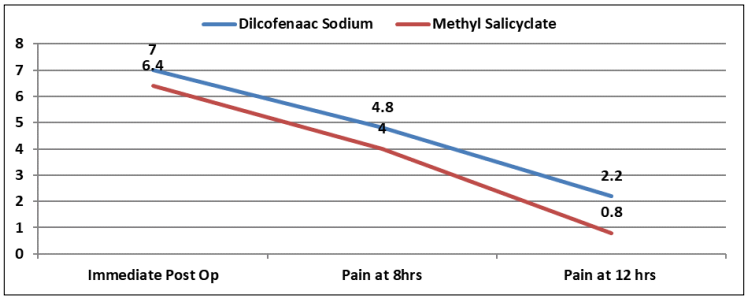

Fig 3

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