

## Status of Complications That Arise After DT and FCLT in the Treatment of Post-Acne Scars in Tertiary Care Teaching Hospital

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### Abstract

**Background:** Acne leads to considerable morbidity this is related to residual scarring and mental disturbances along with bad self-image, depression, and tension, which ends up in a terrible impact on quality of life. **Subjects and Methods:** This prospective, single center, randomized, comparative study of efficacy of resurfacing with fractional CO2 laser therapy (FCLT) versus dermaroller therapy (DT) in the treatment of post acne scars. **Results:** The two groups who underwent the dermaroller and fractional CO2 laser resurfacing treatment were analyzed for male-female ratio. It was seen that 44.1% of the patients were male and 55.9% were females for the dermaroller treatment and in the case of fractional CO2 laser resurfacing treatment the number of females who underwent the treatment was 61.8% as compared to males who were 38.2%. **Conclusion:** The dotted pigmentation of laser and hyperpigmentation post procedure were seen more in case of fractional CO2 laser and the occurrence of pain and discomfort during the procedure was experienced more with dermaroller therapy.

**Keywords:** DT, FCLT, Post-Acne Scars.

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### Introduction

Acne vulgaris is a not unusual skin sickness presenting as non-inflammatory lesions, inflammatory lesions and ranging degrees of scarring, affecting more often than not the face however additionally the returned and chest. Acne leads to considerable morbidity this is related to residual scarring and mental disturbances along with bad self-image, depression, and tension, which ends up in a terrible impact on quality of life.[1] Acne vulgaris is seen to be maximum among the age groups of 14-21, both in boys and ladies. It has been reported to have an effect on as many as 80% of youngsters and teens. The prevalence of pimples scarring in the general population is among 1 and 11 percent, making the treatment of acne scarring a completely relevant subject matter in dermatology today. The early preclinical infection in zits persists at some stage in the zits lesion's lifestyles cycle, from micro-comedones to closed comedones to inflammatory lesions and in the end to postinflammatory erythema, post-inflammatory hyperpigmentation and scarring.[2] The pathogenesis of acne scars involves injury to the skin which initiates a chain of events leading to wound healing. The wound healing process progresses through 3 stages inflammation, granulation tissue formation, and matrix remodeling.[3] The extent of inflammation and tissue damage decides the size and depth of the scars and thus its mode of treatment.[4] Acne scars can be classified into three main categories, depending on whether there is a net loss or gain of collagen atrophic; hypertrophic and keloidal scars respectively. Atrophic scars can be further sub-classified into ice pick; rolling; and box scars. Scar classification is important as it can help guide treatment options.[5]

There are different treatment options that are available for the atrophic scars caused by acne, like chemical peels, microdermabrasion, lasers - non-ablative, ablative lasers, fractional photo thermolysis (FP), pin point irradiation technique, radio-frequency (RF), punch techniques - punch excision, punch elevation, punch replacement grafting, tissue augmenting agents, micro-needling, subcision, combined therapy, stem cell therapy, IPL. Micro needling was first introduced by Dr. Des Fernandes in Europe who called it as a 'skin needling or percutaneous collagen induction (PCI) in the XII congress of the international society of aesthetic plastic surgery in Paris, France in 1993. It is the technique of rolling a device comprising a barrel studded with hundreds of needles, which create thousands of micro punctures in the skin to the level of the papillary to mid-dermis. Of the various ablative fractional lasers, fractional CO2 laser is the most commonly used. Energy at 10,600 nm wavelength is absorbed by both intracellular and extracellular water, causing rapid heating and vaporization of tissue.[6] Aim of the present study was to compare and evaluate the complications that arise after DT and FCLT in the treatment of post-acne scars in tertiary care teaching hospital.

### Subjects and methods

This present study was conducted in the Department of Dermatology, Jawaharlal Nehru Medical College and Hospital, Bhagalpur, Bihar during the period from October,2020 to February,2021 after obtaining approval from the ethical committee of the institute. This prospective, single center, randomized, comparative study of efficacy of resurfacing with fractional CO2 laser therapy (FCLT) versus dermaroller therapy (DT) in the treatment of post acne scars. Total of 68 patients were enrolled in the study. They were divided into two groups of 34 each. One group was treated with dermaroller every four weeks for a period of 24 weeks and the other group was treated with fractional CO2 laser again every four weeks for a period of 24 weeks. Patients with acne scars under the groupings of a score > 3 points on Global Acne Scarring Classification Scale, Patients who were willing to undergo the procedure and Patients above 20 years were included in the study. Patients below 20 years, Patients with acne scars under the groupings of a score < 3 points on Global Acne Scarring Classification Scale, Patients with active acne, Patients with active

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bacterial, viral, or fungal infections in the area to be treated, Patients who has taken isotretinoin within previous 6 months, Predisposition to keloid formation/hypertrophic scarring, Ongoing ultraviolet exposure or prior radiation therapy to treatment area and Pregnant and lactating mothers were excluded from the study. The findings were noted in pretested semi-structured proforma. Data analysis was performed with Microsoft Excel.

**Observations and results**

Total of sixty-eight patients of acne scars were enrolled for this study from the outpatient Department of Dermatology, Venereology and Leprology, Jawaharlal Nehru Medical College and Hospital, Bhagalpur, Bihar. In case of dermaroller treatment, it was seen that the majority of the patients were in the age group of 20 to 25 years and 25 to 30 years comprising 32.4% and 35.3% of each group respectively. Thus, on an aggregate together they made up 67.7% of the total patients in the dermaroller group. On the contrary, the least number of patients were in the >35 years age group comprising 2.9% in fig.1. Similarly, age analysis of patients who underwent the fractional CO2 laser resurfacing treatment showed that the majority of the patients belonged to the age group of 25-30 years (41.2%), followed by patients under the age group of 20-25 years (35.3%). Together it comprised 76.5%. This group a had the least number of patients in < 20 years age group forming 2.9% in fig.1. Thus, the age wise analysis for both groups showed a distribution pattern which was almost similar.

The two groups who underwent the dermaroller and fractional CO2 laser resurfacing treatment were analyzed for male-female ratio. It was seen that 44.1% of the patients were male and 55.9% were females for the dermaroller treatment and in the case of fractional CO2 laser resurfacing treatment the number of females who underwent the treatment was 61.8% as compared to males who were 38.2% in fig.2.

The complications occurring due to dermaroller and the fractional CO2 laser treatment were statistically analyzed. The complications which were analyzed were occurrence of erythema (redness), pain, and hyperpigmentation. The erythema in the post procedure period was seen in 31(91.2%) of patients in dermaroller group and in 26(76.5%) of patients in fractional CO2 laser group.

Patients in the dermaroller group comparatively experienced more pain during procedure and immediately post procedure than those in the laser group i.e. 88.2% of the patients experienced pain in dermaroller group and 64.7% patients experienced pain in the laser group in fig.3.

2(5.9%) patients in dermaroller and 3(8.82%) patients in fractional CO2 laser group developed hyperpigmentation post procedure. Itching is not seen as a complication in the treatment with dermaroller, but in case of fractional CO2 laser group, a very small percentage of patients experienced itching a few days after the treatment due to peeling off of the scab that was formed after treatment.

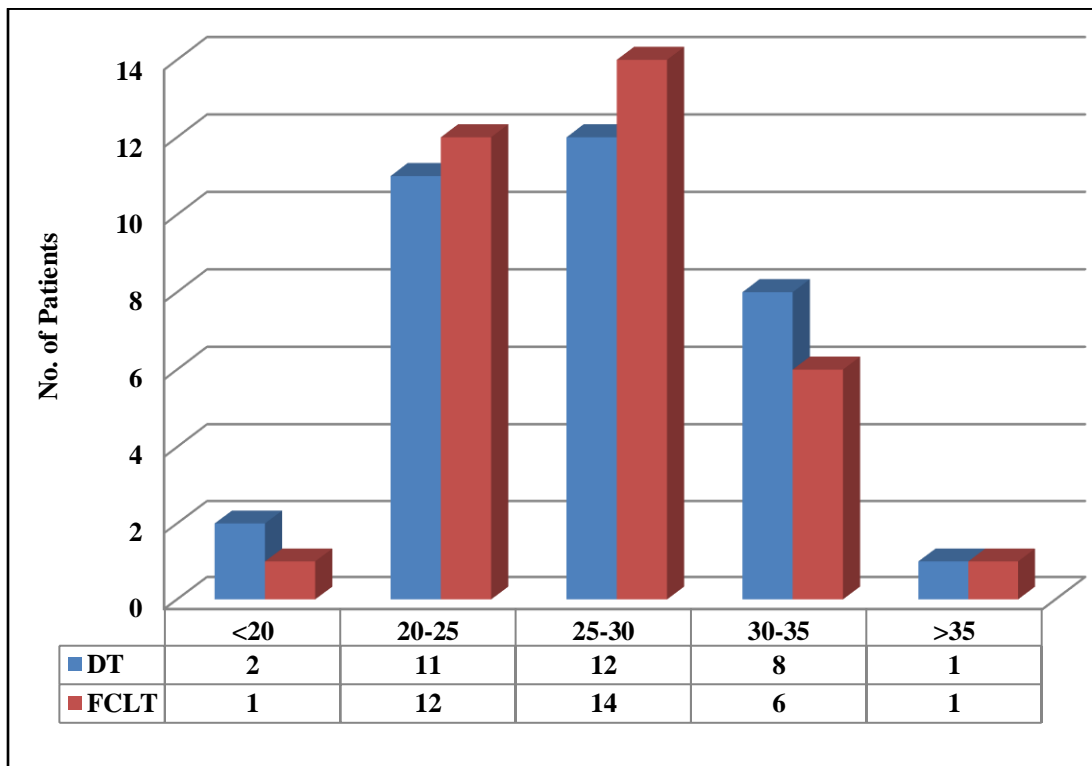


Fig. 1: Shows the demographic details of the patient

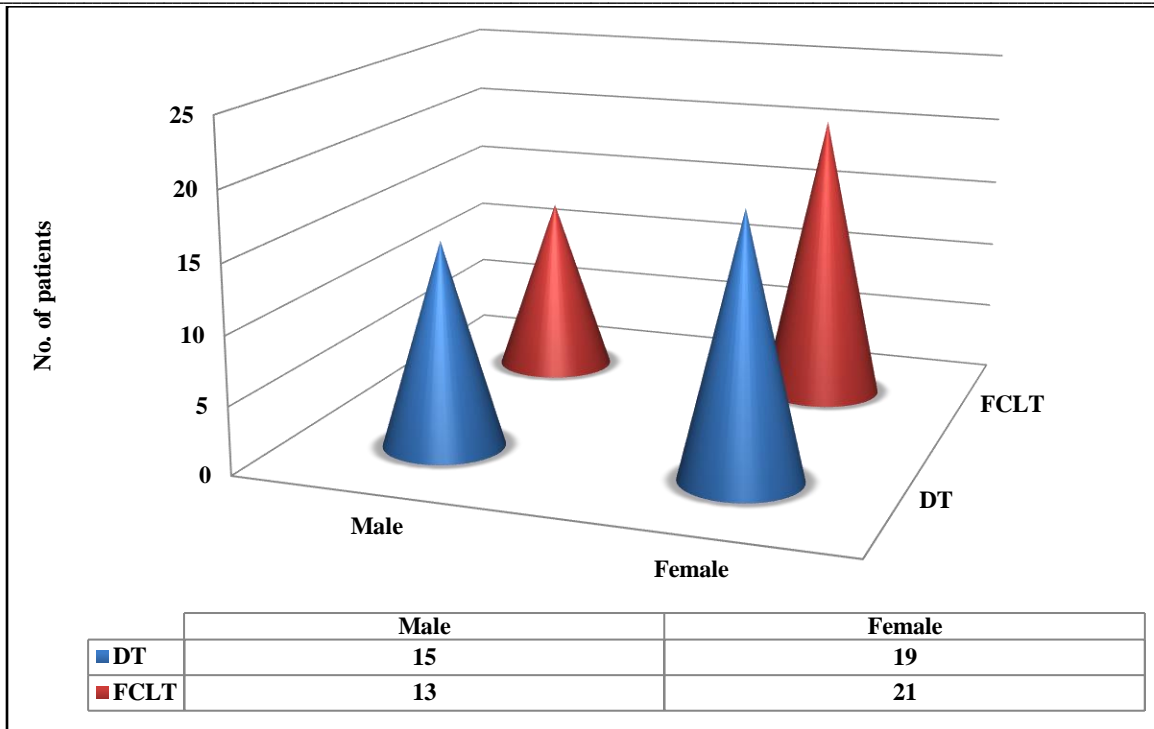


Fig. 2: Shows the comparison of gender distribution between DT and FCLT

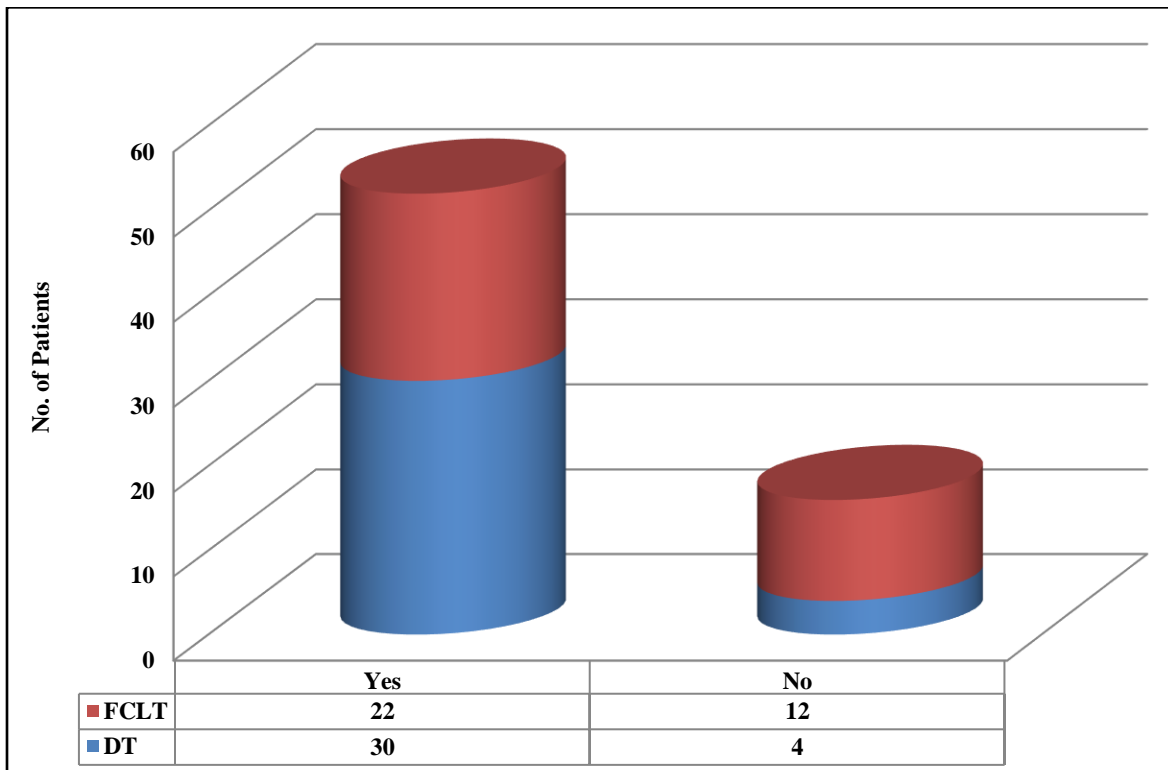


Fig. 3: Shows the pain after DT and FCLT

**Discussion**

The age of the patients was recorded by using the data from the questionnaire. Age wise analysis for both groups showed a distribution pattern which was almost similar. It was seen that the

majority of the patients were in the age group of 20 to 25 years and 25 to 30 years comprising 67.7% of the total patients in dermaroller group. Similarly in fractional CO2 laser group majority of the patients belonged to the age group of 25-30 years (41.2%), followed by

patients under the age group of 20-25 years (35.3%). It has been noted that acne is associated with specific age groups of patients in higher incidence whereas it is low in other age groups. Acne and its complications are more prevalent among teenagers and the young adults. Acne vulgaris affects majority of the teen age groups and the most sufferers belong to the age group of 12-24 years.[7] The occurrence of acne reduces after age the of 25 years and the percentage of patients is as low as 8%. Similarly in this study majority of the patients are in the age group of 20-30 years. The awareness of new treatment modalities like micro needling and laser too is more among these age groups, thus it is relevant that the percentage of patients under the age groups of 20-25 and 25 -30 years were higher. The two groups who underwent the dermaroller and fractional CO2 laser resurfacing treatment were analyzed for male-female ratio. It was seen that 44.1% of the patients were male and 55.9% were females for the Derma-roller treatment and in the case of fractional CO2 laser resurfacing treatment the number of females who underwent the treatment was 38.2% compared to the males who were 61.8%. The results indicated a higher prevalence of females undergoing treatment for post acne scars than the males. The complications which were analyzed in this study were occurrence of erythema (redness), pain, and hyperpigmentation. It was seen that occurrence of hyperpigmentation post procedure were seen more in case of fractional CO2 laser than dermaroller therapy and the incidence of pain and discomfort during the procedure was experienced more with dermaroller than fractional CO2 laser.[8] Erythema which was seen more in most of the dermaroller patients (91.2%) and it was also seen in the laser group comprising 76.5% which was temporary and lasted for 2-3 days post procedure. Hyperpigmentation which was seen in around 8.82% of fractional CO2 laser patients and 5.9% patients of dermaroller which resolved on its own within a period of 4-6 weeks without any sequelae. The complaint of pain was seen more in the dermaroller group of 88.2% and comprised of about 64.7% of patients in the dermaroller group which appeared during the procedure and lasted to a few hours after it. Various studies on the efficacy of dermaroller and fractional CO2 laser in treatment of scars have been conducted in the past but very limited data is available on comparison between these two modalities. Both dermaroller and fractional CO2 laser have proven their efficacy in treatment of scars. A comparative study conducted in 2017 between the two modalities of treatment showed that all patients in Dermaroller group improved of which 88.2% improved by at least one grade and 12.8% patients showed improvement of the scars by 2 grades in Goodman and Baron qualitative scar grading scale. The treatment appears to be safe apart from transient redness, mild dryness, and small hematomas.[9] Transient erythema is the most common adverse event noticed.[10] One such study conducted by Majid (2009) with 37 patients and it was seen that the dermaroller therapy was extremely effective in the removal of even severe scars. It has been described by Majid that "Dermaroller treatment thus has definite advantages such as its cheaper cost, the comparative ease of the overall procedure and also the minimal downtime associated with it".[11] Studies conducted on the gender distribution of the acne scar treatment among boys and girls indicated a lot of variation. The severity of acne in males is higher than in females in studies conducted by Adhityan and Thapa.[12] Female patients account for two thirds of visits made to dermatologists for acne, and one third of all dermatology office visits for acne are by women who are older than 25 years. Girls with acne are known to show greater levels of anxiety in comparison to the boys though it has been known to be unrelated to acne. As compared to men, in general, women have a higher

chance of developing major depression, anxiety, and neurotic disorder and might have overall impaired quality of life.[13] They experience more negative body language than boys and are more anxious about their looks and thus feel a greater need for the acne scar treatment than the boys.[14]

### Conclusion

These findings suggest that both methods are equally effective in overall scar reduction, but fractional CO2 laser resurfacing method is more effective method for the treatment of severe acne scars than derma roller as indicated by the statistical analysis. Complications such as of dotted pigmentation of laser and hyperpigmentation post procedure were seen more in case of fractional CO2 laser and the occurrence of pain and discomfort during the procedure was experienced more with dermaroller therapy.

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