



THE THERAPIST

JOURNAL OF PHYSIOTHERAPY & REHABILITATION SCIENCES

<https://thetherapist.com.pk/index.php/tt>

Volume 1, Issue 2 (July-Dec 2020)



Guest Editorial

Role of Tension in Skin Scarring

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Key Words:

Skin Scarring, Healing, Tention

How to Cite:

Naqvi, S. I. Z. . (2020). Role of Tension in Skin Scarring. *THE THERAPIST (Journal of Therapies & Rehabilitation Sciences)*, 1(2), 02. <https://doi.org/10.54393/tt.v1i2.13>

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Article History

Received: 25th July 2020

Accepted: 20th August 2020

Published: 30th December 2020

Skin scarring is a natural process of healing and represents a massive burden on individuals and societies. Scars appear due to sealing of an open skin that occurs more quickly than the normal skin growing process. Depending on the place where scars form, people may suffer severe issues like not able to bend their joints, open or close their mouth parts and lastly suffer from social stigma. A scar is not bad if it is small, not visible or easy to heal. But it is astonishing that recent researches have opened up new ways for us to treat scars instead of hiding them under clothes.

Recently, scientists suggested the critical role of tension during process of scarring. They observed that early in the fetal developmental stage, when the skin is more gelatinous (less tight), the skin injury does not lead to scarring and likewise, at the older age (95 years) scarring is minimal due to less tightening of skin. Now, the questions arise; why and how tension in the skin induces scar formation during healing?

The gene named "**engrailed**" helps produce a protein (sometimes found in fibroblast; a skin cell) that stimulates scar formation. Researchers observed that fibroblasts did not express engrailed when grown on tension-free gel; but the expression occurs when grown on stress-inducing plastic. In the later case, inhibition in expression of engrailed was observed after addition of a chemical which inhibits mechanical strain signaling. Similarly, a number of studies in mice suggested a crucial role of tension in induction of scarring.

For a successful wound healing therapy, three outcomes are important to be true skin regeneration; appearance of normal hair follicles and glands, normal epidermal appearance under microscope and regenerated skin needs to be as strong as normal skin. Concurrent to these outcomes, scientists are working with mice by blocking mechanical stress signals with U.S approved drugs and waiting for next stage with pre-clinical trials with other mammalian species.

In summary, with the rising social and financial burdens of scarring, advancements in the research inspire novel therapies to tackle outcomes of scar formation. Recent studies focus on the role of mechanical forces during scarring whereas, clinical trials favor minimizing tension may lead to minimal scar formation. However, tension free therapies for scar reduction persist various limitations and sometimes, not applicable. It is also noteworthy that considerable differences between the mouse and human skin may limit the applications of clinical findings.

