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The Impact of Intralesional 5-Fluorouracil in the Treatment of Keloid Scars

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Background

- The American Academy of Dermatology (AAD) defines a keloid scar as a type of raised scar extending past the initial area of injury¹
- Approximately 10% of the general population affected - significant risk factors include +family history, darker skin tones, mechanism of injury (burn, surgical)³
- Symptom presentation: pain, pruritus, burning, increased sensitivity³
- Varying existing treatment methods with high resistance and recurrence rates leading to no agreed upon standard approach⁵
 - Most widely adopted method currently : **intralesional (ILS) steroid injection⁵**

Purpose: Audit the available data on the efficacy of intralesional 5-fluorouracil (ILS 5-FU) in the treatment of keloids and whether its use should become more mainstream and/or perhaps a standard of care

Methodologies

- **Databases:** PubMed, Google Scholar
- **Search Terms:** keloid, keloid treatment, efficacy, 5-fluorouracil/5-FU, intralesional steroid, triamcinolone
- A manual title/abstract review with subsequent full-text review was performed to yield a total of **4 articles**
- **Journals:** Journal of Plastic, Reconstructive, and Aesthetic Surgery, World Journal of Plastic Surgery, Burns, Archives of Dermatological Research

Inclusion Criteria : 2018 – present, adult population (all races, ages, genders) with at least 1 keloid scar undergoing treatment with ILS 5-FU

Exclusion Criteria : Full text unavailable, not in English, studies focused on efficacy of dosing schedules/injection strengths of 5-FU

Findings

Level of Evidence:

- Small sample sizes (49-108 keloids)
- 3 Randomized control trials
- 1 randomized parallel group study

Limitations:

- Small sample sizes
- Varying treatment groups (5-FU, TMC, 5-FU+TMC, BTX-A)
- Injection technique
- Different measurement outcomes (POSAS vs VSS)

Study	Treatment Groups	Outcome
Hietanen et al	5-FU v. TMC (ILS)	Similar rates of remission (not statistically significant)
Srivastava et al	5-FU v. TMC v 5-FU + TMC (ILS)	ILS 5-FU + ILS TMC
Khalid et al	TMC v 5-FU + TMC (ILS)	ILS 5-FU + ILS TMC
Ismail et al	5-FU v BTX-A (ILS)	ILS BTX-A

- Local side effects
 - Telangiectasia – Risk **INCREASED** in TMC groups
 - Skin atrophy – Risk **INCREASED** in TMC groups
 - Skin ulceration – Risk **INCREASED** in 5-FU group

Conclusion

- Intralesional 5-fluorouracil is efficacious in treating keloid scars, both in size and symptom reduction
- The most impressive results were seen in keloids injected with a combination of **ILS 5-FU and ILS steroid (TMC)**

Further Research:

- Larger scale studies comparing ILS 5-FU, ILS TMC, and Botox efficacy in treating keloids
- Specific injection dosages/ratios of 5-FU: TMC
- Injection schedules that most effectively treat keloid scars

Clinical Relevance

ILS 5-Fluorouracil should be considered as part of the standard approach of all keloid treatments, without specific 5-FU drug contraindications, in order to see the most potent results and minimal adverse effects

References

1. Keloid scars: Overview. American Academy of Dermatology. <https://www.aad.org/public/diseases/a-z/keloids-overview>. Accessed April 13, 2023.
2. McGinty S, Siddiqui WJ. Neuroplasticity - statpearls - NCBI bookshelf. Keloid. <https://www.ncbi.nlm.nih.gov/books/NBK557811/>. Published July 19, 2022. Accessed April 17, 2023.
3. Dynamed. Keloid and Hypertrophic Scar. EBSCO Information Services. Accessed April 15, 2023. <https://www.dynamed.com/condition/keloid-and-hypertrophic-scar>
4. Lu W, Chu H, Zheng X. Effects on quality of life and psychosocial wellbeing in Chinese patients with keloids. *Am J Transl Res*. 2021;13(3):1636-1642. Published 2021 Mar 15.
5. Ekstein SF, Wyles SP, Moran SL, Meves A. Keloids: A review of therapeutic management - wiley online library. Keloids: a review of therapeutic management. <https://onlinelibrary.wiley.com/doi/full/10.1111/ijd.15159>. Published September 9, 2020.
6. Fluorouracil. American Osteopathic College of Dermatology (AOCD). <https://www.aocd.org/general/custom.asp?page=Fluorouracil>. Accessed April 17, 2023.
7. Hietanen KE, Järvinen TA, Huhtala H, Tolonen TT, Kuokkanen HO, Kaartinen IS. Treatment of keloid scars with intralesional triamcinolone and 5-fluorouracil injections - a randomized controlled trial. *J Plast Reconstr Aesthet Surg*. 2019;72(1):4-11. doi:10.1016/j.bjps.2018.05.052
8. Srivastava S, Patil A, Prakash C, Kumari H. Comparison of Intralesional Triamcinolone Acetonide, 5-Fluorouracil, and Their Combination in Treatment of Keloids. *World J Plast Surg*. 2018;7(2):212-219.
9. Khalid FA, Mehrose MY, Saleem M, et al. Comparison of efficacy and safety of intralesional triamcinolone and combination of triamcinolone with 5-fluorouracil in the treatment of keloids and hypertrophic scars: Randomised control trial. *Burns*. 2019;45(1):69-75. doi:10.1016/j.burns.2018.08.011
10. Ismail SA, Mohammed NHK, Sotohy M, Abou-Taleb DAE. Botulinum toxin type A versus 5-Fluorouracil in treatment of keloid. *Arch Dermatol Res*. 2021;313(7):549-556. doi:10.1007/s00403-020-02132-8