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Clinical Assessment of the Efficacy and Safety of Intralesional Injection of Triamcinolone Acetonide for Treatment of Chronic Radio Dermatitis

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Abstract:

Background: Chronic radio dermatitis is a frequent side effect of radiotherapy. It may be associated with decreased quality of life. **Aims:** The aim of this study was to evaluate the clinical efficacy and safety of intralesional injection of triamcinolone acetonide for the treatment of patients with chronic radio dermatitis. **Methods:** This study was a prospective clinical trial conducted on 30 patients who attended to oncology outpatient clinic in Sohag University Hospital with chronic radiodermatitis.**Informed consent was signed by all patients.** The patients were subjected to preliminary assessment including a detailed medical history, general and local examination. All patients were examined and the grade and severity of grade of radiation induced fibrosis was determined by palpating and comparing thickness, density, firmness, fixation or retraction of the irradiated skin to contralateral non-irradiated skin. The patients were subjected to intralesional steroid of diluted triamcinolone acetonide. The injection was carried out by dermojet and spaced at 1 cm interval. Injection was done every 2 weeks and for 3 months. **Results:** We found that 23.3% of patients had no response, 26.7% with one grade response (slight improvement), 3.3% had two grades response (moderate improvement), while 46.7% recorded complete improvement. **Conclusion:** Intralesional injection of triamcinolone acetonide is an effective and safe modality for treatment of chronic radio dermatitis.

Keywords: *chronic radiodermatitis, intralesional injection of triamcinolone*

1 Introduction

Chronic radio dermatitis occurs due to chronic exposure to "sub-erythema" doses of ionizing radiation over a prolonged period It produces variable degrees of damage to the skin and its underlying parts after a variable latent period of several months to several decades. It is mediated through damage to the dermis [1].Chronic radio dermatitis manifests as indurated plaques,

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telangiectasia, pigmentation changes and permanent epilation. With progressive chronic radio dermatitis, chronic ulcers appear [2].Chronic dermatitis has established grading criteria that that are specific for chronic radiodermatitis, according to degree of fibrosis that can be clinically evaluated by palpation and comparing density, firmness, fixation or retraction of the irradiated skin to contralateral un-irradiated area into four grades [3,4]. Topical corticosteroids have anti-inflammatory action by inhibiting the up-regulation of cytokines in response to radiation [5].In addition; it reduces the production of collagen and proteins that form fibrous tissue that is considered the major sequel of chronic radio dermatitis, which causes fibrous tissue to soften [6]. Intralesional steroid is superior to topical use, due to its ability to by-pass the barrier of a thickened stratum corneum, and therefore avoiding epidermal atrophy and delivering higher concentrations to the site of the pathology [7]. This study evaluated the clinical efficacy and safety of intralesional injection of triamcinolone acetonide for the treatment of patients with chronic radio dermatitis.

2 Methods:

This study represents a prospective clinical trial conducted on 30 patients who attended to the oncology outpatient clinic in Sohag University Hospital between July 2012 and July 2013. The study was approved by Research and Ethical Committee at Sohag Faculty of Medicine. ***Informed consent was signed by all patients.*** Patients were subjected to preliminary assessment including a detailed medical history, general and local examination.

All patients with chronic radio dermatitis due to external: beam radiotherapy for tumor treatment were included. Patients with history suggestive of one of the following conditions were excluded acute cases of radio dermatitis, history of triamcinolone hypersensitivity, uncontrolled diabetes, and heart failure or sever hypertension. An informed consent was signed by all patients after procedures and discussing the possible side effects explaining with them. All patients were examined and determined grade of radiation induced fibrosis severity by palpating and comparing thickness, density, firmness, fixation or retraction of the irradiated skin to contralateral non-irradiated skin, then we categorized the patients according to severity of radiotherapy induced fibrosis into four grades according to the Subjective Objective Medical management and Analytic evaluation injury (SOMA) system [3,4].Grade1: Just palpable skin with increase skin density. Grade 2: Definitely increased density and firmness. Grade 3: Very marked increased density with retraction, rigidity and fixation. Grade 4: Skin ulceration.

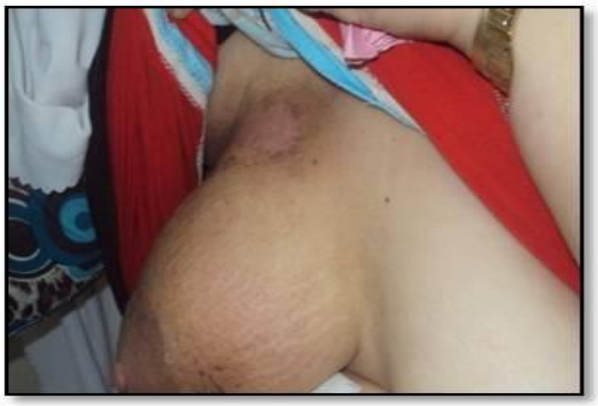

Figure 1a: Chronic radio dermatitis lesion the righ breastdeveloping after radiotherapy for treatment of breast cancer. There is showing verymarkedly increased of skin density, hardening of the breast in affected site (grade 3).

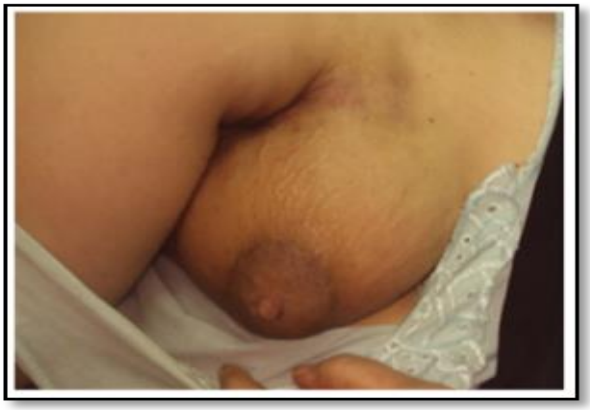

Figure 1b: The clinical response after 3 months of intra lesional injection of triamcinolone acetonide. There ismoderate retaining skin elasticity and softening the lesion turning it into (grade 1), witha decrease of decrease in the intensity of hyperpigmentation.

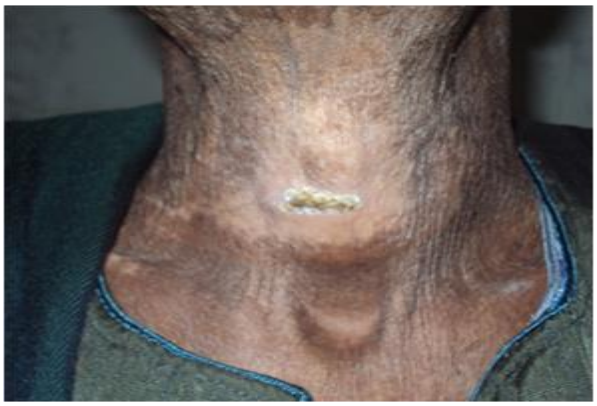

Figure 2a:A 60 years old patient with chronic radiodermatitis lesion involving in the anterior aspect of the neck developed after radiotherapy for treatment of laryngeal The skin lesion developed squamous cell carcinoma, showing definitely increased density and firmness of skin (grade 2), with increased skin thickness.

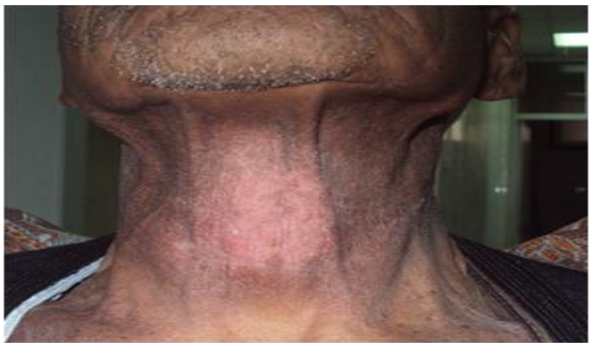

Figure 2b: Complete clinical improvement of the lesion after 3 months of intra lesional injection of triamcinolone acetonide with skin softening and retaining normal thickness.

The 30 patients were subjected to intralesional injection of steroid (triamcinolone acctonide such as kenacort A 40 suspension 40 mg/ml). The solution was diluted with 4 ml of normal saline and injection was carried out by dermojet. The injection sites were spaced at 1 cm interval. Injection was done every 2 weeks and for 3 months.Regression or improvement of chronic radiation induced fibrosis was in the form of skin softening, retaining skin elasticity, texture, and getting rid of skin in duration, was estimated by palpation and comparing skin density, thickening and firmness before and after treatment according to grading system ofOvergaard et al [3]& Hoeller et al [4]According to these groups, no grade response (no improvement; one grade response (slight improvement); two grade response (moderate improvement) and complete regression (complement improvement of the lesions).

3 Statistical Analysis:

Statistical analysis was performed using SPSS version 10.P-value less than 0.05 was considered statistically significant.

4 Results:

The Mean of age of the studied patients was 48, 33 ± 10, 88(mean +/- SD).The study included 8 males and 22 females. Fourteen patient had complete response, one patient had two grade responses (moderate response), 8 patients had one grade response (slight response) and seven patients has no response. The improvement of skin fibrosis was in the form of improved skin texture, elasticity, skin softening and getting rid of skin indurations. A summary of these findings is shown in Table 1.Our results showed significant correlation between duration of chronic radio dermatitis and degree of improvement with (p value= 0.0002). The patients with shorter duration recorded better response. A summary of these findings is shown in Table 2.There was a significant correlation between the grade of severity of chronic radio dermatitis and the outcome of treatment as shown in Table 3. The degree of improvement was high in patients with grade 1 morbidity and all patients achieved complete response with complete regression of fibrosis with better skin softening. In patients with grade 2 lesions, 10% had no response, 50% had slight improvement and the remaining 40% showed complete improvement. In patients with grade 3 lesions, 50% of them showed slight improvement while 33.3% had no improvement and 16.7% had moderate improvement. In patients with grade 4 lesions, complete healing occurred in 33.3%. No healing occurred in the remaining 66.7% of the remaining patents. A summary of these findings is shown in Table3

Table (1): The clinical characteristics of the patients with chronic radio dermatitis.

Variable		Number	Percent%
Age	≤50 y	17	56.75 %
	>50 y	13	43.35 %
Sex	Males	8	26.7%
	Females	22	73.3%
Body mass index	<25	12	40%
	25-30	8	26.7%
	>30	10	33.3%
Smoking	Yes	8	26.7%
	No	22	73.3%
Residence	Rural	22	73.3%
	Urban	8	26.7%
Marital status	Married	29	96.7%
	Single	1	3.3%
Occupation:	Farmer	6	20%
	Worker	1	3.3%
	Student	1	3.3%
	Housewives	22	73.3%
Site of radio dermatitis	**Trunk**	19	63.3%
	Non-trunk	11	36.7%
Duration of radio dermatitis	**≤12 monthes**	19	63.3%
	>12 monthes	11	36.7%
Grade of radio dermatitis	**One**	8	26.7%
	Two	10	33.3%
	Three	6	20%
	Four	6	20%

Table (2): Correlation between duration of chronic radio dermatitis and degree of response to intraleisional injection of triamicinolacetonide:

			Improvement (%)				Total
			No response	One grade response	Two grades response	Complete response	
Duration	≤12 months	Count	0	6	0	13	19
		(%)	0 %	75 %	0 %	92.9%	83.3 %
	>1 year months	Count	7	2	1	1	11
		(%)	100%	25 %	100%	7.1%	16.7 %
Total		Count	7	8	1	14	30
		(%)	100 %	100 %	100 %	100 %	100 %

P-value 0.0002 (highly significant)

Table (3): Correlation between severity of chronic radio dermatitis and degree of response to intraleisional injection of triamicinolacetonide:

	Grade1		Grade2		Grade3		Grade4	
	N	%	N	%	N	%	N	%
No	0	0%	1	10%	2	33.3%	4	66.7%
One grade	0	0%	5	50%	3	50%	0	0%
Two grades	0	0%	0	0%	1	16.%7	0	0%
Complete	8	100%	4	40%	0	0%	2	33.3%
Total	8		10		6		6	

P-value = 0.001 (highly significant)

5 Discussion:

Our study evaluated the clinical efficacy and safety of intralesional injection of triamcinolone acetonide for the treatment of patients with chronic radio dermatitis. The degree of improvement of radiation induced skin fibrosis was clinically evaluated and reported. We proposed that steroid injection has beneficial effects due to its effect on reducing the production of collagen and proteins that form fibrous tissue due to its protein catabolic action and anti-inflammatory effect.

To the best of our knowledge, no previous reports are available about the use of intralesional injection of triamcinolone acetonide for treatment of chronic radio dermatitis.

In thisstudy,23.3% of patients gave no response, 26.7% with one grade response (slight improvement), 3.3% had two grades response (moderate improvement), while 46.7% recorded complete improvement.

This improvement could be explained by that the anti-inflammatory and catabolic effects of intralesional injection of triamcinolone acetonide [5,6]. Also, the use of intralesional route for corticosteroid administration ensured the delivery of high contraction of the therapeutic agent to the lesion. It also bypassed the thickened skin (barrier for administration).

This study found a significant correlation between the duration of chronic radio dermatitis and the degree of improvement. The patients with shorter duration recorded better response.

We found variations in the degree of improvement among lesions with different grades of severity of chronic radiodermatitis. A significant correlation was observed in patients with low grade lesions who attained the best response.

Similarly, lesions with shorter duration (having less fibrotic changes) showed significantly The treatment was tolerated by all patients, none of the patients developed any serious side effects following the use of intralesional triamcinolone acetonide injection, and there was only slight transient pain at site of injection.

Despite small sample size in our study, a clear fact was obtained regarding the clinical effectiveness of intralesional injection of triamcinolone acetonide as a new effective, safe, less costly and promising therapeutic agent in treatment of chronic radio dermatitis lesion, especially for patients with low grade morbidity and short radio dermatitis latency period.

In conclusion, intralesional injection of triamcinolone acetonide in treatment of chronic radio dermatitis, proved clinical efficacy and safety in reversing chronic radiotherapy damage Better response was observed in patients with: short duration of chronic radio dermatitis and low grade radio dermatitis.

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