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FINGERTIP LESIONS
AN EVALUATION OF CONSERVATIVE TREATMENT VERSUS FREE SKIN GRAFTING

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Lesions of the fingertips are very common injuries and the number seems to be rising, partly because of increasing mechanization and partly, at least in Denmark, because of the increasing number of foreign workers who do not pay sufficient attention to safety precautions or maybe do not understand them. In 1961 Clarkson indicated that in the United Kingdom about 100,000 patients a year were treated in emergency rooms for lesions of one or more fingertips, and Constant writes that in 1966 17 per cent of the injuries reported to the insurance companies were made up of fingertip lesions.

An injury to the tip of a finger is perhaps a small injury, but it is important, as the time of convalescence is often comparatively long and the patients may have great difficulty getting back to work again. Constant (1971) indicates that the period of incapacitation varies from 10–108 days, always being a couple of weeks longer in insured cases than in the non-insured.

The actual treatment depends, not only on the size and nature of the defect, but also on the patient's age and profession and not least on his mental habitus and in addition on the degree of specialization of the department in which he is treated.

There are a variety of methods by which pulp lesions can be treated taking the above into consideration.

1) Primary suture.
2) Shortening of the finger with suturing of soft parts.
3) Plastic surgical methods, either free skin grafting or various more complicated procedures.
4) Conservative treatment.

This last method which this paper is trying to illustrate, viz. conservative treatment with spontaneous healing of the defect, is not highly regarded in the literature and several have actually warned against it.

MATERIAL

In a five-year period 107 patients with pulp lesions, by which we mean lesions distal to the distal interphalangeal joint that do not include either flexor or extensor tendons, but often nail and nailbed, were treated in the emergency room at Gentofte Hospital.

Table 1. Distribution according to sex, age and treatment in 107 patients with fingertip lesions.

		♂	♀	<15	15–30	31–50	>50
38	4)	21	17	6	10	14	8
Conservative treatment		55%	45%				
32	1)	24	8	6	14	3	9
Primary suture		75%	25%				
18	3)	14	4	8	7	0	3
Transplantation of skin		78%	22%				
19	2)	17	2	1	4	8	6
Amputation		90%	10%				

Table 2. Distribution according to type of lesion and treatment in 107 patients with fingertip lesions.

		Lesion of soft tissue only	Lesion of soft tissue including nail and nailbed	Lesion of soft tissue and bone	Lesion of soft tissue, nail and bone
38	4)	38	8	3	3
Conservative					
32	1)	32	13	3	5
Primary suture					
18	3)	18	9	4	4
Transplantation of skin					
19	2)	19	19	16	16
Amputation					

Table 3. Subjective complaints at follow-up on 107 patients treated for fingertip lesions.

	Subjective complaints							Results		
	Shortening	Coldness	Hypaesthesia	Paraesthesia	Hyperaesthesia	Tenderness	Stiffness	Good	Acceptable	Poor
38 pt. Conservative treatment		15 39%	10 26%	0	1 3%	5 13%		34 90%	4 10%	
32 pt. Primary suture		10 31%	12 38%	2 6%	2 6%	6 19%	3 9%	28 88%	4 13%	
18 pt. Transplantation	2 16%	6 33%	12 67%	1 6%	1 6%	6 33%	3 17%	10 56%	6 33%	2 16%
19 pt. Amputation	11 58%	15 79%	5 26%	5 26%	2 13%	8 42%	6 32%	9 47%	6 32%	4 21%

Table 4. Objective findings at follow-up on 107 patients treated for fingertip lesions.

	Objective findings													
	Atrophy	Fissured skin	Adhered skin	Deficient nail	Indurated scar	Tenderness	Abnormal mobility of joints	Diminished touch	Hyp-aesthesia	Hyper-aesthesia	Diminished 2-point discrimination	Diminished temperature feeling	Diminished stereognosis	Cyanosis
38 pt.	1	0	2	5	18	2	0	4	5	1	3	3	0	0
Conservative	2.6%		6%	13%	48%	6%		10%	13%	2.6%	8%	8%		
32 pt.	2	1		4	3	1	3	6	10	3	9	8	4	0
Primary suture	6%	3%		13%	9%	3%	9%	19%	31%	9%	28%	25%	13%	
18 pt.	12	10	3	11	12	0	6	11	12	4	12	5	5	0
Transplantation of skin	67%	56%	17%	6%	67%		33%	61%	67%	23%	67%	28%	28%	
19 pt.	2	1	2	4	0	5	9	3	4	9	5	2	6	0
Amputation	11%	5.5%	11%	21%		26%	47%	17%	21%	47%	26%	11%	32%	

Table 5. Duration of treatment in 107 patients with fingertip lesion.

	4 weeks		4–8 weeks		8 weeks	
Conservative treatment	25	81%	6	19%		
Primary suture	14	61%	7	31%	2	9%
Transplantation of skin	4	57%	3	43%		
Amputation	5	33%	8	53%	2	13%

They have been followed up after an interval of 5–10 years. Table 1 shows the distribution between men and women and the age distribution. The types of lesion are indicated in Table 2. The following methods of treatment have been used: Primary suture, shortening of the finger with suture, free skin grafting, or conservative treatment. The latter is characterized by open wound treatment after removal of any protruding bone. The wound is dressed with Fucidine gauze or some similar antibiotic preparation and is left to granulate and epithelialize spontaneously.

At the follow-up examination the patients have been thoroughly questioned as to any subjective complaints. The results are indicated in Table 3 which also shows the patients' subjective impression of the final result of the various methods of treatment.

The physical examination has been concentrated on the condition of the scar, the trophic condition, sensibility, function of the joints and the state of the finger as a whole. The results are indicated in Table 4. The hands have been photographed and tested with the Ninhydrin test. The duration of treatment is indicated in Table 5.

DISCUSSION

The emergency service involved in this study is a large, general emergency service with about 100–120 cases per 24 hours. It is attended by surgical house officers and only in rare cases has plastic surgery expertise been available. Only recently a department of hand surgery has been established; this was not in operation when the patients included in this study were treated.

The demands of a satisfactory treatment of fingertip injuries are:

1) The length of the finger must be preserved as much as possible.
2) The stump must be covered with good, non-tender soft tissue.
3) The sensibility must be as normal as possible.
4) There must be free movement of joints.

Only the less complicated methods are considered in the present material and there are no plastic procedures like Kuttler's (Fischer 1967), Wesley Snow's method (1967), transplants of toetips (Marchac & Rousso 1971), V-Y plasty (Atasoy et al. 1970) or the usage of ped-

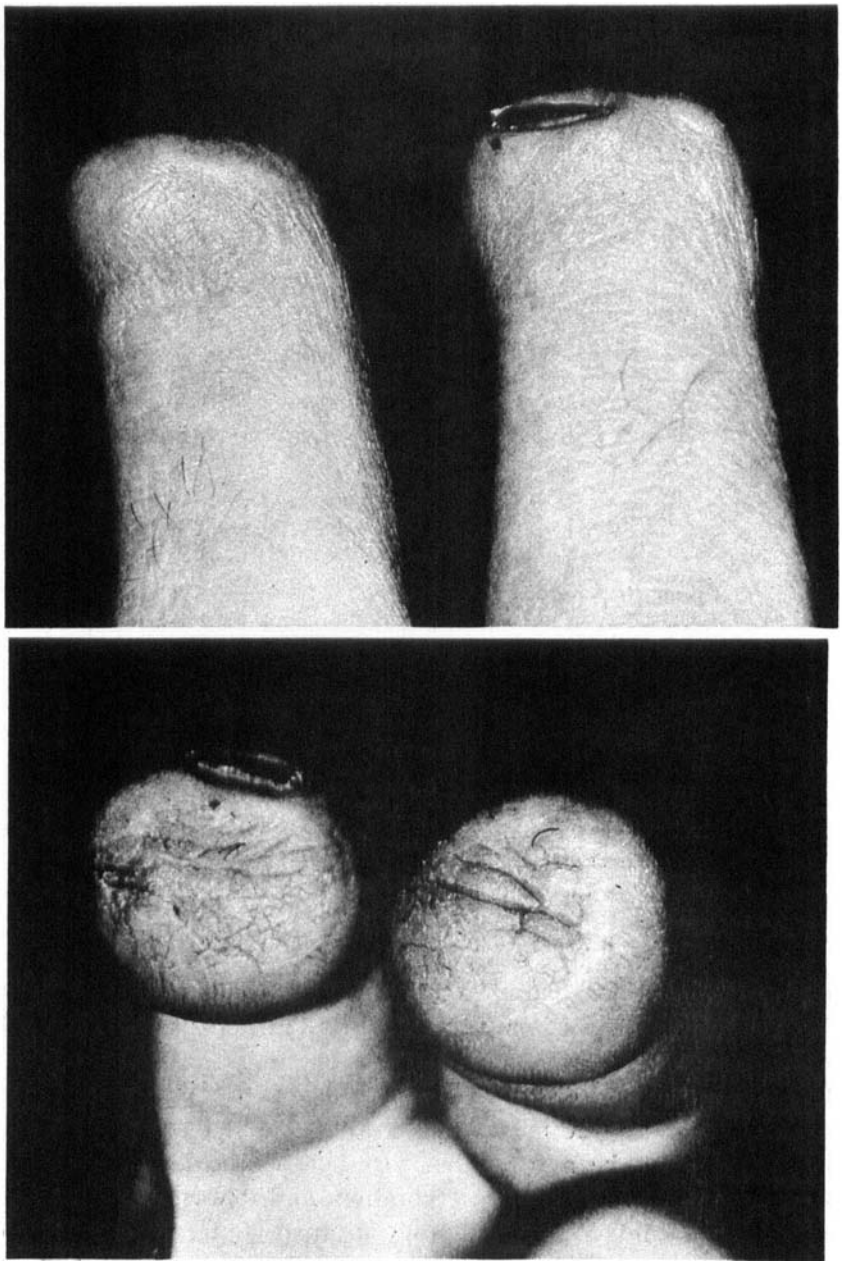

Figure 1. Sequels after fingertip lesion treated with grafting of a free intermediate thickness graft. Note the angular shape, the small annoying remains of the nail and the formation of skin fissures in the graft.

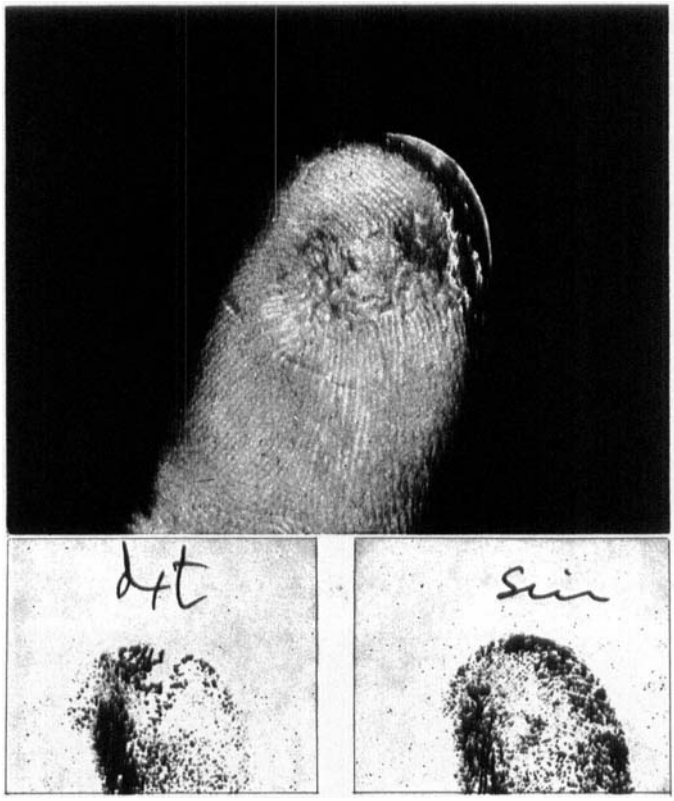

Figure 2. Fingertip lesion treated conservatively. Note the slightly indurated scar. The Ninhydrin test shows absence of perspiration in the scar. The same finger on the other hand serves as control.

icled grafts from the palm or from other fingers as for instance indicated by Gottlieb & Mathiesen (1961), Flint & Harrison (1965) and Bennett (1966).

It is clear that the patient's age and the type of lesion is of importance for the selection of the method of treatment and its results, but the results here have been evaluated together as the groups otherwise would have been too small for evaluation, and it was felt that a compiled study of a mixed material from an unspecialized emergency service might be of interest.

Primary suture gave good results, the subjective result being good in 88 per cent and there being no poor results, but this can only be carried out in feasible lesions.

Figure 3. Well-healed intermediate thickness graft. The Ninhydrin test shows no functioning sweat glands in the graft. The next finger serves as control.

Partial amputation with primary suture of soft parts results in shortening of the finger which was subjectively troublesome in 58 per cent of patients. The stump of course is covered with a solid soft tissue cover and usually has good sensibility, but it is often annoyingly tender. This was found in 26 per cent while those conservatively treated are only tender in 6 per cent of cases and those grafted do not have this complaint at all. The same observation has been made in other studies. Boysen-Møller et al. (1961) find tenderness in 36 per cent of the partially amputated as compared to 21 per cent of those treated conservatively and 22 per cent of the grafted cases, and in a material from 1963, Sturman & Duran, find a similar tenderness in the partially amputated in 41 per cent. They have no conservatively treated

cases, but these authors also find tenderness in as large a number as 68–70 per cent of patients treated with primary free skin grafting.

Free skin grafting preserves the length of the finger, but the stump often acquires a rather unbecoming square shape. A further important complaint is indurated and fissured skin at the site of grafting (Figure 1). This was found in 67 per cent and just as many have decreased sensibility. Similar findings have been made by Jakobsen & Kunov (1967) with Mandal's method and Mandal himself (1962) also mentions this without quoting any figures. In reality Mandal's method only consists of a very meticulously executed free skin grafting with a thick intermediate graft. (Mandal 1962, 1965, Jakobsen & Kunov 1967). It must be mentioned additionally that 66 per cent have complaints regarding the donor site on the forearm.

The conservative treatment as carried out in the emergency room at Gentofte Hospital consists, as mentioned above, of covering the defect with Fucidine gauze and a compressive dressing, and changing this dressing on an ambulatory basis about every 5 days. This method gives the longest possible finger stump with a rounded fingertip and good soft tissue covering (Figure 2) though with an indurated scar in 48 per cent and reduced sensibility in 13 per cent as compared to 67 per cent of the grafts. The scar, however, is small (Figure 2) as the defect contracts during the spontaneous granulation and epithelialization and pulls skin and subcutaneous tissue with normal sensibility in from the surroundings.

The conservatively treated only have few subjective complaints, mostly from cold. However, these are no more pronounced than for the other methods of treatment. The subjective results were good in 90 per cent of cases, and there were no poor results. The second best results from a subjective point of view, 88 per cent good, were found in primary suture. The graft cases were only good in 33 per cent and poor in 16 per cent and amputation gave 32 per cent good and 21 per cent poor results.

The conservative treatment has not been mentioned much in the literature. Boysen-Møller et al. did a follow-up on such a series in 1961 and compared it with other methods. They recommend the conservative treatment emphasizing that these patients get a cosmetically better, more rounded fingertip than those receiving free grafts; the sensibility is more normal, and an advantage compared with reamputation is that the stump is not tender.

Atrophy of the finger stump in the present series was found in 67

per cent with grafts, 11 per cent with amputations, 6 per cent with primary suture and only 2.6 per cent with conservative treatment.

Nail changes were rather evenly distributed throughout the series and obviously depended on the site of the lesion. If the patient later developed symptoms from the nail, the authors have carried out excision of the residual nail and nailbed with application of a full thickness graft.

Changes in the sensibility were found in a very large number of patients. Thus, in grafted patients sensibility was reduced in 67 per cent, in primary suture patients in 31 per cent, in amputation patients in 21 per cent and in 10 per cent of those treated conservatively. Hypersensibility was found in 23 per cent of grafts, 9 per cent of primary sutures, 47 per cent of amputations and 2.6 per cent of those conservatively treated.

The Ninhydrin test shows changes in the scar itself and in the grafts (Figure 2 and Figure 3) which speaks in favour of choosing that procedure which is liable to give the smallest scar or graft respectively.

Permanent reduction of joint mobility was found in 28 per cent of the grafted patients, in 13 per cent of the primary suture patients, in 32 per cent of amputation patients and in none of the patients with conservative treatment. This is dependent on the duration of immobilization and could probably be reduced.

CONCLUSION

On the basis of the present study and the results of others it can be concluded that fingertip injuries if treated in an ordinary emergency room, without plastic surgical expertise, in most cases are best treated with a conservative regime if primary suture cannot be carried out. Partial amputation gives shortening and tenderness, grafts give trouble from the scar and reduced sensibility while conservative treatment preserves finger length, gives good, round stumps with small scars and good sensibility.

Furthermore, conservative treatment gives fewer complications as regards joint function and has the shortest duration of treatment.

SUMMARY

107 patients with fingertip injuries have been followed up after 5–10 years. The following principles of treatment were used, 1) primary

suture, 2) partial amputation and suture, 3) free skin grafts, 4) conservative treatment.

It is concluded from the results and comparison with the work of others that conservative treatment gives subjectively good results in 90 per cent of cases and no poor results.

The results of primary suture are equally good and this should be carried out if possible. The most important complaints after partial amputation are shortening and tenderness, and after grafting, induration and fissuring of the skin and reduced sensibility of the graft as well as complaints from the donor site.

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