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CONSERVATIVE MANAGEMENT OF GUILLOTINE AMPUTATION OF THE FINGER IN CHILDREN

B. S. DOUGLAS[1]

From the Department of Surgery, Adelaide Children's Hospital, Adelaide

SYNOPSIS

A prospective study has shown that the guillotine amputation of the finger in small children can be treated conservatively by dressing only and that there is no need for hospital admission or operation for this condition.

A guillotine amputation of the finger in a child is a common enough injury, but the results of treatment are not satisfactory, especially if they are not treated by a trained, interested medical practitioner (Thompson, 1963). It was suggested by Rank, Wakefield and Hueston (1968) that such lesions in small children could be treated conservatively and a prospective study was undertaken

(a) to see if conservative treatment was successful, and
(b) to compare the results of conservative and operative treatment.

METHOD

A prospective study was instituted of all cases with a guillotine amputation of part of the finger. At the time of admission they were classified either A or B on a register, A or B being decided by sequence only. Treatment A, or conservative treatment, was to dress the wound with tulle gras and a dry dressing, without splintage, as an out patient. The finger was re-examined at 10 days, and then at fortnightly intervals until healed.

Treatment B involved an operation of the surgeon's choice.

A photograph and a radiograph of the finger were taken in each case and all children were given tetanus toxoid, and oral penicillin for 5 days.

RESULTS

There were 46 cases in the series, of which 29 had received treatment A (conservative treatment) and 17 had an operation. The reasons for the discrepancy in the size of the groups are as follows: 2 of the earlier cases in the conservative group were referred by other surgeons to the plastic surgeon for grafting, and these patients were eliminated from the series. Once it was realised that the conservative treatment was producing good results, more cases were treated in this way by the resident staff to avoid admission and operation.

The average age of the children was 4½ years, and the oldest in the group A was 8 years. The sex incidence and side of injury were approximately equal. The longest fingers were most commonly injured, i.e. the index, middle and ring fingers, and the commonest type of injury was a finger jammed in a closing door.

Exposure of bone (Fig. 1) was recorded at the time of admission (Table 1) and it can be seen that exposure of bone was approximately equal in the two groups.

The time taken to heal is shown in Table II and in all cases treated conservatively the finger healed spontaneously (Fig. 2 and 3).

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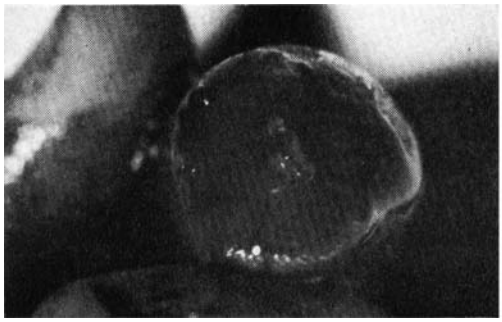
1. Surgeon.



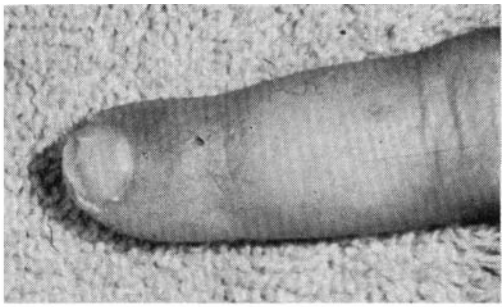


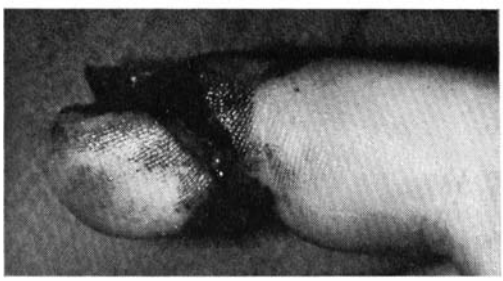
Figure 1. Note exposed bone at time of injury and remarkable restoration of the tip.

TABLE I

Exposed Bone	Exposed	Total
Total series	33	46
'A' (conservative) treatment	20	29
'B' (operative) treatment	13	17

TABLE II
Group 'B' Operative Group

Type of Operation	Total	Days to Heal (Av.)
Split skin graft	5	25
Full thickness graft	5	16
Trimming and suture	6	16
Flap graft	1	30
	17	



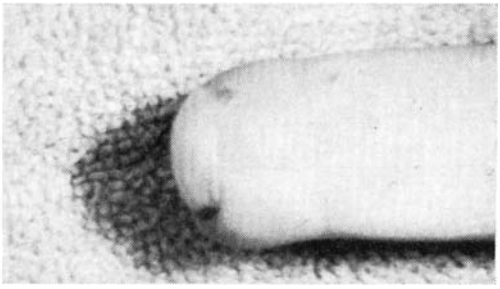
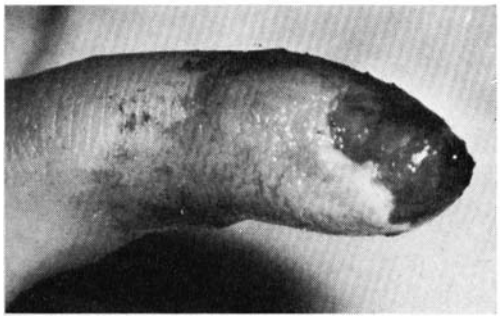


Figure 2. Lacerations combined with guillotine injury, showing healing without sutures.



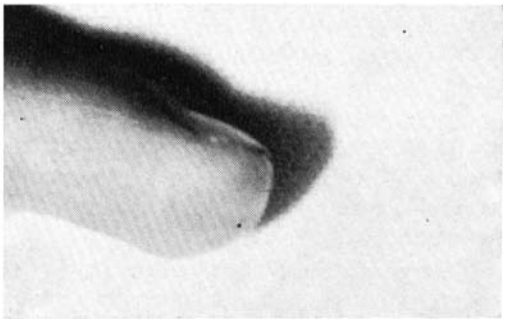


Figure 3. Avulsion of skin as well as amputation, with restoration of near normal contour.

There was no instance of osteomyelitis, or a painful tethered stump. During healing there was a remarkable apparent lengthening of the stump (Fig. 4) and a relative return to a normal contour.

The time of healing in group B is shown in Table III. Healing after a split skin graft took as long as those in which exposed bone was treated conservatively.

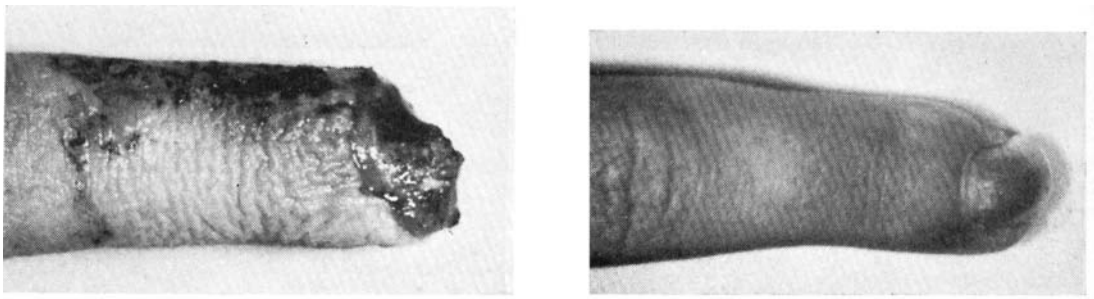


Figure 4. The regrowth of the pulp is apparent, as well as minimal distortion of the finger nail.

TABLE III
Group 'A' (conservative) Time to Heal (days)

	Average	Range
Total series	22	9-40
'A' (conservative) treatment		
Total	24	10-40
With bone exposed	26	14-40
No bone exposed	19	10-30

DISCUSSION

It has long been a surgical principle that exposed bone should be covered. Rank *et al.*, (1968) reported that guillotine amputation of the finger in young children could be treated by dressings alone. I had certainly been impressed by the lack of success of grafting in such injuries, at least when performed by registrar and resident staff. The results of this survey amply confirm the statement that this type of injury can be satisfactorily treated conservatively. All the fingers so treated healed spontaneously without evidence of osteomyelitis, painful or tethered stumps, or troublesome remnants of the finger nail.

One possible criticism of this form of treatment is that it takes, on average, one month for the lesion to heal. Thompson (1963) made the point that unless all these lesions were treated by one interested person, the time for healing after operative treatment is no shorter than with conservative treatment. The results of operative treatment in this series also were bad. A split skin graft has no place in the treatment of this type of injury, as stated by Rank *et al.*, (1968). All other methods of operation involve further shortening of the stump to achieve a non-terminal scar or a distended scar at the site of the injury.

There are many advantages in conservative management. First, the lesion will heal even if bone is exposed. Healing is accompanied by apparent lengthening, an important reason cosmetically, but functionally essential in the case of the index finger and thumb. The mechanism of this lengthening appears to be a growth of granulations from the exposed bone end and their subsequent covering by skin from the periphery. The resultant scar is very small, and usually just proximal to the leading edge of the nail, with finger prints and skin with normal sensation covering the end of the stump.

These children do not have to be admitted to hospital and so escape any emotional problems that may ensue, as well as the slight risk of anaesthesia. There is not the additional scarring at the donor site of the graft, nor the shortened stump following refashioning. Healing time is not significantly longer than operative treatment performed by registrar or resident staff.

This survey indicates that guillotine amputation of the finger in young children is best treated by simple dressings. We do not believe that the same treatment would be applicable to adults' fingers or to children's toes, for the

healing potential in these two instances are not as great as in a child's finger. The oldest child treated conservatively in this series was 8 years old, and it is thought that 8 to 10 years of age is probably the upper limit at which this type of treatment should be attempted.

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REFERENCES

Rank, B. K., Wakefield, A. R. and Hueston, J. T. (1968). Surgery of repair as applied to hand injuries. Edinburgh: Livingstone, p. 133.

Thomson, R. V. (1963). Essential details in the technique of finger amputations. *Med. J. Aust.*, **2**: 14-18.

Department of Surgery,
Adelaide Children's Hospital (Inc),
North Adelaide, Australia, 5006.