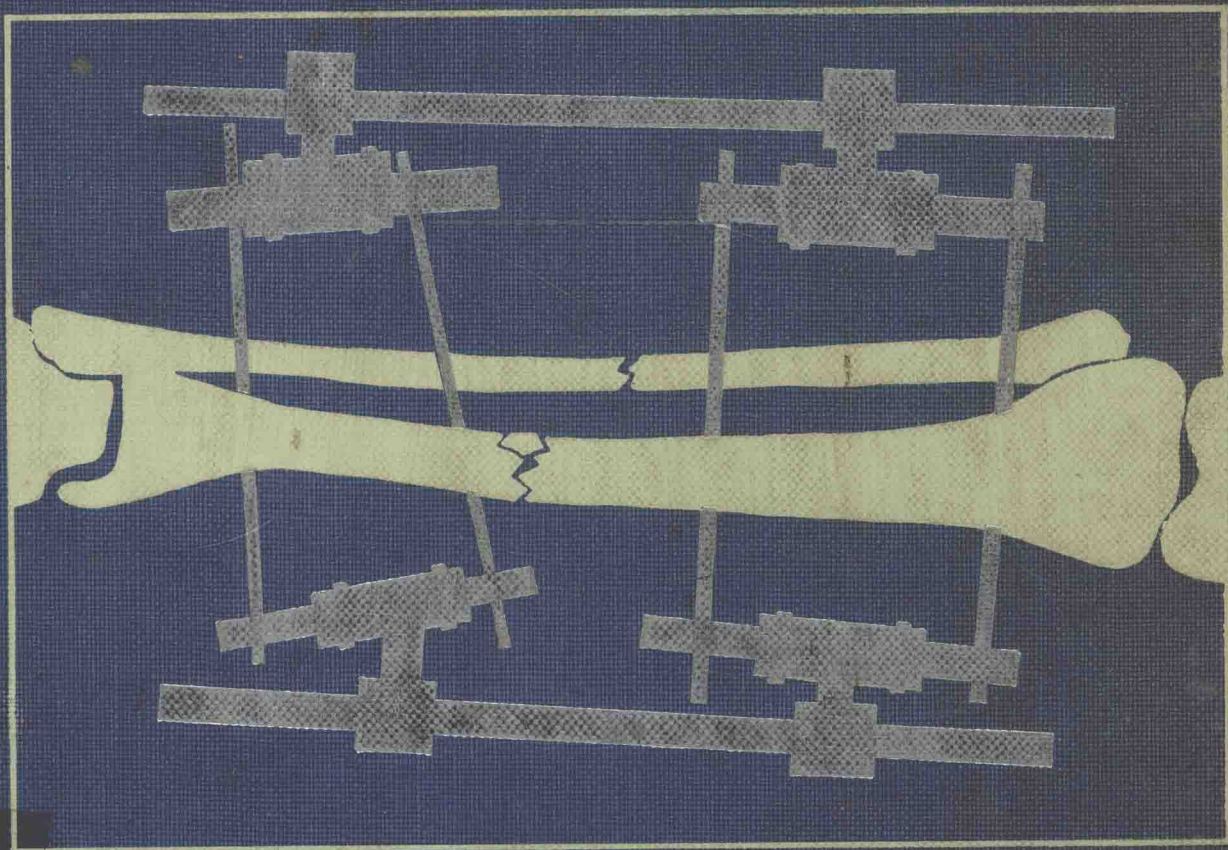

The Severely Injured Limb



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CHURCHILL LIVINGSTONE

THE SEVERELY INJURED LIMB

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Preface

Major injuries of the limbs are no longer confined to the battlefield. Over the last 40 years, with the increased use of motor vehicles capable of travelling at high speeds, high velocity injuries producing severe bone and soft tissue damage have become commonplace in most major accident units. Increased specialisation and the great technical advances that have occurred over this period make it unlikely that one surgical team has the necessary skills and expertise to treat adequately every aspect of such injuries. Regular conferences and instructional courses take place amongst each surgical sub-specialty, but all the experts skilled in the treatment of the various aspects of such injuries are seldom gathered under one roof.

This book was inspired by one conference that succeeded in bridging the specialty divides: an international meeting held at the Robert Jones and Agnes Hunt Orthopaedic Hospital in Oswestry to discuss the wide range of skills necessary to the proper management of major limb injuries. Acknowledged experts in their fields were invited from the United Kingdom and abroad to present papers covering the range of different disciplines which may be required in the management of such cases. Successful results require a team approach and in organising such a conference it was the aim to encourage an exchange of ideas between the different surgical specialities.

Such was the success of this conference that it was decided to commission a book on the same subject, inviting many of the participants to expand the material presented at the meeting to form a comprehensive manual on the management of severe limb injuries. The book recognises that the patient's management should be directed by a surgeon from one of the specialist fields, often the Orthopaedic or General Surgeon. It is emphasised by all concerned that early involvement of surgeons from associated disciplines producing a team approach allows a smooth and co-ordinated programme of management. The distant location of surgical specialities from the Accident Department can make such coordination difficult. It is hoped that this book in drawing specialists from the different fields will encourage the fertilisation of ideas and closer cooperation.

The technical advances in all surgical fields that have occurred particularly in the last 30 years produce difficulties for the training of younger surgeons. We have therefore concentrated in one section of this book the technical details of a range of different external fixation devices in order to emphasise the importance of the need to

practise the practical skills necessary to master this sort of equipment. We would encourage the development of practical laboratories in every main teaching hospital so that the wide range of surgical procedures now available can be practised on models in the laboratory rather than in the operating theatre.

We hope that this volume will allow wider dissemination of the ideas discussed at the conference and enable orthopaedic, traumatic, general, vascular, microsurgical and plastic surgeons to become more conversant with recent developments in each other's fields.

1983

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SECTION ONE

Assessment

1

Diagnosis: a general view

P.S. London

One of the interpretations of the word diagnosis is collecting the information required to make the following important decisions:

Is the limb worth saving?

If so, what is the best that one can expect to achieve with the injured limb?

How should one go about saving it?

Later one may have to decide whether the effort was worth while.

In some cases it is at once clear that a limb is beyond salvation but if both upper limbs have been severely injured there is a special need to try to save something useful on one side.

The decision to save a limb and the steps required to do so will often be taken by one person whereas later it may be necessary to call upon the services of several specialists to make the best of what has been saved. Although what is saved may be far short of normal in function, the patient may find that it serves his purpose adequately and decline any further operations (Figs 1.1, 1.2, 1.3, 1.4a,b).

In planning the first stage in treatment one has to decide if the limb can be saved, if it is likely that it can be healed without serious infection and if it can be rendered useful. These decisions can usually be made only with the aid of a general anaesthetic.

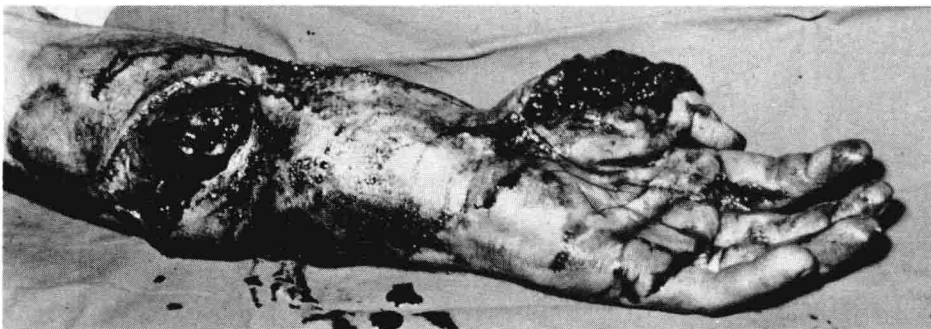


Fig. 1.1



Figs 1.1, 1.2 This man lost his right upper limb below the elbow and at the same time suffered severe injuries of the left forearm and hand, for which, when healed, he declined further treatment

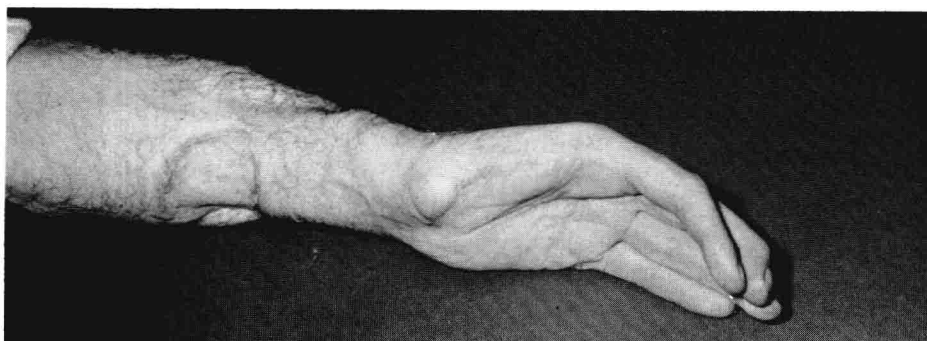


Fig. 1.3



Fig. 1.4a



Figs 1.3, 1.4a & b He made little use of his artificial limb and was almost completely independent

Examination of the injured limb

It is, to say the least, unkind to tinker about with a badly injured limb in the casualty reception area in order to try to decide what to do with it. When examining it under anaesthetic a correctly used tourniquet may be of great value. Sometimes one needs to be able to look at tissues without bleeding, and at other times the presence of bleeding is important in deciding what to do next. In order to make a complete diagnosis one may have to increase the damage by enlarging the existing wound for the sake of adequate exploration. Such additional damage should be kept to the minimum, but there is no substitute for the human eye as an instrument of exploration. X-ray examination may be of great value; plain radiography is usually sufficient but arteriography is occasionally necessary to localize a lesion rather than to identify its nature; identification should be carried out in the process of exploration.

The upper limb

The upper limb is a prop for the hand. Can one save a limb like that shown in Figures 1.5–1.8? The answer is that one must, because the hand still has an adequate cir-



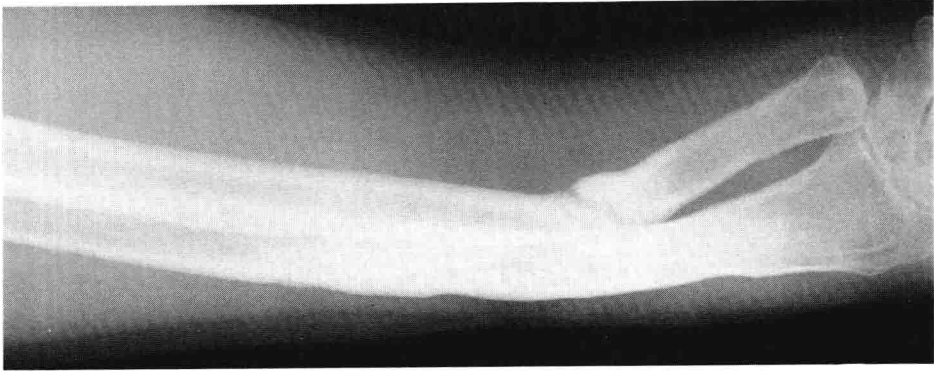
Fig. 1.5 The limb was two thirds amputated



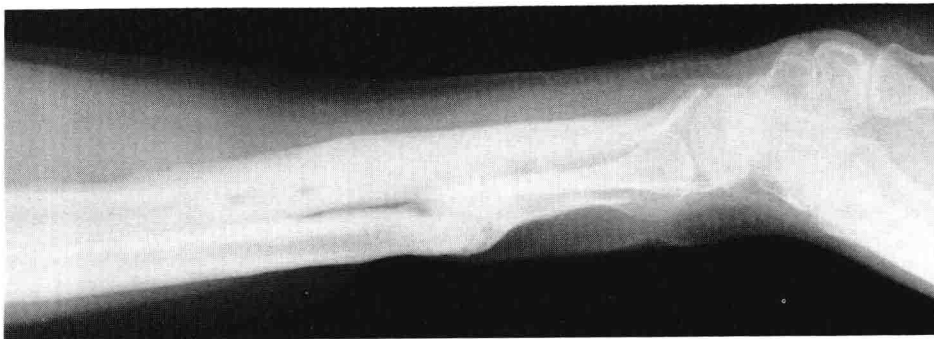
Fig. 1.6 Immediate fixation and closure was followed by infection, refracture, further fixation and bone grafting and recurrence of infection



Fig. 1.7



a



b

Figs 1.7, 1.8a & b The patient did not lose heart and after three years had a useful limb again

culuation and the median and ulnar nerves are still intact although the extensor muscles have been completely transected, as have some of the flexors. The main requirements are comparable to those of re-attaching a severed part: trim generously, fix securely and repair in whatever stages are necessary.

Figures 1.9–1.13 show another severely injured upper limb five days after a road accident in the Middle East. In spite of the loss of all the skin from elbow to knuckles, a good deal of muscle and part of the ulna, with a fracture of the radius as well, there



Fig. 1.9 This limb was trapped beneath an overturned car

Fig. 1.10



Fig. 1.11



Fig. 1.12



Fig. 1.13



Figs 1.10–1.13 He retained a hand that was perhaps more acceptable cosmetically than useful after receiving a large flap from the belly.