SOME EXPERIENCES WITH A PARACHUTE SURGICAL UNIT.

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The formation of Parachute Surgical Units has been the logical development of the present surgical policy of the Royal Army Medical Corps in which surgical units work in the forward areas; and in fact the surgeon is brought to the patient as opposed to the patient being evacuated to the surgeon. Thus the long-established principle that early surgery prevents infection and accelerates ultimate recovery has been applied to modern war and even to parachute units.

Our unit, in addition to being the first parachute surgical unit, was also the first to go into action; and so we have been fortunate in having an unique experience, particularly from a surgical standpoint. The unit, which included a surgeon and anesthetist, is attached to a parachute field ambulance. The equipment, all of which was dropped by parachute with the unit, includes an operating table, instruments, dressings, plaster of Paris, blood plasma, sterilizer, anesthetic equipment, drugs, medical comforts and even a bedpan. It was found sufficient to perform 145 surgical operations and about 100 dressings with a margin to spare; such equipment as a building, transport, beds, blankets, etc., was obtained locally after dropping.

The operations performed were 136 on allied troops or prisoners, with a mortality of 2.9 per cent, and 9 on civilians. The civilians were impossible to follow up and so only troops are included in the following table. Of the civilians two died before evacuation which occurred at an average time of three days after admission. Conservative treatment was carried out on 28 troops and 65 civilians. Of these, three from the troops and eight civilians were moribund on admission and did not recover sufficiently for surgery, so the total number of admissions to the Dressing Station was 238, of which a total of 17, or 7.2 per cent, died. Of the moribund many were admitted within a few minutes of injury and their wounds were very severe. The following table illustrates the type of injury, and the immediate results of treatment amongst the troops, the cases being followed up for six weeks.

<table>
<thead>
<tr>
<th>Troops treated surgically</th>
<th>Discharged to duty within six weeks</th>
<th>Untraced (11 known to be alive after leaving C.C.S.)</th>
<th>Died</th>
<th>Total treated: 164. Total mortality: 7 (4.3%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Troops treated conservatively</td>
<td>Discharged to duty within six weeks</td>
<td>Untraced</td>
<td>Died (moribund on admission)</td>
<td></td>
</tr>
<tr>
<td>Type of injury amongst troops: Single wounds</td>
<td>122</td>
<td></td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Multiple wounds</td>
<td>42</td>
<td></td>
<td>4</td>
<td>(2.9%)</td>
</tr>
</tbody>
</table>

Flesh wounds | 77
Compound fractures | 34
Through and through bullet wounds (treated conservatively) | 15
Abdominal wounds
| Colon and bladder | 2
| Stomach | 2
| Colon and small bowel | 2
| Colon and kidney | 2
| Thoraco-abdominal | 2

Burns | 7
Intrathoracic wounds | 5
Eye injuries | 4
Penetrating joint wounds | 3
Urethral wounds | 2
Simple fractures | 2
Intracranial wounds | 2
Peripheral nerve centres | 2
Gross jaw wound | 1
Spinal wound (with paraplegia) | 1
Not recorded | 12
Of the cases which died following surgery two were abdominal wounds and two compound fractures, one with gas gangrene.

The cases were operated upon in an average time of ten and a half hours after injury and it is this fact which I think explains the low mortality for such severe cases. The actual time in which they were admitted was considerably less than this.

The plan of treatment was very orthodox although it was adapted to permit the dropping of the equipment by parachute. Surgical shock was treated on orthodox lines with the modification that, as the quantity of plasma was limited, those cases in which it was considered advisable were given whole blood in place of plasma. The blood was obtained from the personnel of the unit who had previously been grouped as were all combatant parachutists. Thus a large saving of space was achieved. As regards chemotherapy, every case received a prophylactic course of sulphanilamide or sulphapyridine in addition to its introduction into every wound. The anaesthetic principally used was pentothal, supplemented when necessary with chloroform and ether mixture.

The surgery of flesh wounds was complete excision, dusting with sulphanilamide powder and the laying on of vaseline or dry gauze, linen thread being used for ligatures. Although the cases were obtained early it was not considered advisable to perform primary suture in view of the long line of evacuation. Uncomplicated through and through bullet wounds were treated conservatively, sulphanilamide powder being introduced into the track with a probe and no excision being performed, not even of the skin edge. The results were satisfactory, twelve of the fifteen cases so treated being discharged from hospital to duty in fourteen days and the remaining three within six weeks. Due to the limited supply of plaster no case of soft tissue wound was placed in plaster.

Compound fractures were treated on the same lines as flesh wounds and enclosed in complete plasters; they were not evacuated for at least three days. Compound fractures of the femur were the exception, a Thomas' splint with adhesive plaster skin traction being used in these cases.

Of the eight abdominal wounds six lived, the deaths being a wound of lung, liver and colon and a gross wound of small intestine and its mesentery. The treatment adopted was suture of perforations with resection in one case and colostomy in wounds of the colon either above or at the site of injury. The liver wounds and the one renal were packed; bladder wounds and the two urethral wounds were treated by suprapubic cystostomy. In all cases sulphanilamide powder was placed intraperitoneally in the region of the injured viscera. Abdominal cavity drainage was only adopted in the case of colonic wounds but drainage of the abdominal wall was instituted in every case.

Intrathoracic wounds were treated by excision of the chest wall wound with closure of the muscle layers with interrupted sutures, the skin being left open. In every case the pleural cavity was aspirated and in two cases with a large external wound, the bleeding from the lung was controlled by suture of the lung. In three cases the pleura was not drained and these travelled much better than the two with pleural drains although they had to be aspirated at intervals during evacuation.

Burns were treated by thorough cleansing, dusting with sulphanilamide powder and a gauze dressing; joint wounds by excision of the wound and early movements. Eye wounds consisted principally of cases of intra-ocular foreign bodies which were evacuated as soon as possible to the base. One case of gross injury was treated by enucleation of the eye.

The one case of gross jaw injury was treated by tracheotomy and wound toilet without excision. Partial suture particularly of the buccal mucosa was performed and the patient evacuated to the facio-maxillary unit at the base. The case of spinal wound was found to have a raised pressure and blood was present in the cerebrospinal fluid on lumbar puncture. In view of this and in the presence of a complete paraplegia a laminectomy was performed, several intrathecal foreign bodies removed and the torn dura mater sutured; intermittent catheterization was used in this case. He was known to be alive on evacuation from a General Hospital. No attempt was made to suture the two cases of divided peripheral nerves. The
two intracranial wounds were excised, depressed bone elevated or removed, foreign bodies removed, if seen, and the torn dura mater sutured, sulphanilamide powder being placed extradurally; both lived, one returning to duty within six weeks.

Two patients developed gas gangrene, one before and one after excision. The first was treated by early amputation and lived, the second was of very rapid onset and died within twelve hours; this was a gross crush injury of thigh and would probably have survived if an amputation instead of wound excision had been performed initially, particularly as the shock was under control. Only one other limb was amputated and this was for a gross injury of foot and ankle.

**DISCUSSION AND CONCLUSIONS.**

1. Surgery in a forward area is possible, even with parachute troops, and seems to be justified by results. The employment of more surgeons in the advanced and main dressing stations is suggested.

2. Pressure of work necessitates conservative treatment in many cases, 93 or 39 per cent of our series, and uncomplicated through and through bullet wounds benefit by avoiding surgery as is shown by their rapid return to duty if not operated on.

3. Again in forward areas without X-rays much time may be wasted looking for foreign bodies, usually without success. Of our cases with suspected foreign bodies only about 25 per cent were removed and in many of these additional foreign bodies were left in situ. Provided these wounds are not sutured the presence of the foreign body does not appear to delay healing unduly and it can always be removed under the more advantageous conditions of the base hospital. These foreign bodies were remarkable for their variety and size. One weighing 8.5 pounds was removed from the thigh and it had not fractured the femur.

4. We have noted that badly wounded cases which are to be kept for long near the battle area require heavy doses of sedative and this has led in some instances to evacuation before the optimum time.

**SUMMARY.**

An outline of the work of a parachute surgical unit is given.

Early surgery in an average time of ten and a half hours from wounding gave a low mortality and morbidity considering the nature of the injuries (4 of 136, or 2.9 per cent of the troops operated on).