EARLY COMPLICATIONS RESULTING FROM RETAINED BONE FRAGMENTS IN A CASE OF GUNSHOT WOUND OF THE HEAD.

By CAPTAIN W. E. TYNDALL, R.A.M.C.(S.R.).

THE following case of gunshot wound of the head presented some features of interest:

Pte. G. was admitted in the early morning of November 5th suffering from bullet wound of the head. He was unconscious and collapsed; the pulse was imperceptible, temperature subnormal, and respirations shallow. He was very cold and evidently suffering from shock. The scalp wound was about 3 inches long, of the gutter type, and lay antero-posteriorly in the left parietal region. It was very dirty and jagged, with blood clot and brain tissue escaping from it. His right arm and right leg were paralysed.

First Operation.

He was put to bed, infused subcutaneously with normal saline, and the wound was dressed. In the evening his con-

dition had improved and it was decided to operate. Under chloroform the edges of the wound were excised, the wound was well washed with normal saline and explored. There was a fissure fracture 2 in. long in the left parietal bone, about 1½ in. below the superior longitudinal sinus, with two fissures radiating from its posterior end; the dura was lacerated and the brain tissue oedematous and broken down. The brain was explored by finger, half a dozen small bits of bone were removed, and the edges of the wound in the cranium were cut away to expose the free edges of the dura. The wound was washed with normal saline and closed by suture. A flap had to be cut from the upper surface (Wallace method) to allow the edges to be brought together. A rubber drain was placed under the flap down to the opening in the dura and left for twenty-four hours.

Next morning the patient's condition was much improved, and he recovered consciousness towards evening.

He continued to improve, and eleven days after the operation all signs of paralysis had disappeared. The wound had healed by first intention, the edges of the flap were covered by healthy granulations, and there were no signs of hernia cerebri. He was able to sit up in bed and untie his bandages, and was shown "fit for evacuation."

On the evening of November 17th he complained of frontal headache, but was relieved by aspirin. He slept well during the night, but on the evening of November 18th there was a slight rise of temperature, and he again complained of headache. The following day he was drowsy, lay on his right side, his head covered and bent on his chest, his legs drawn up, and frequently complained of the pain in his head. This condition continued for the next four days.

During the night of November 21st his temperature rose to 104° F., and in the morning he was very dull and apathetic, but showed no definite symptoms. He vomited about midday. There was no optic neuritis, and the pupils were normal. There was no hernia nor increased pressure in his wound.

Second Operation.

Lumbar puncture showed slightly increased pressure; the cerebro-spinal fluid was examined by Captain Buckell, pathologist, who reported:

"Cerebro-spinal fluid is turbid; total white cells 200 per c.cm.; polymorph leucocytes 91 per cent.; lymphocytes 9 per cent. No organisms seen on direct examination. Cultures on tryptic agar and trypsin agar both sterile."

A small incision was made along the line of union of the original wound, from which a little clear fluid escaped. There was a slight hernia of the brain outside the dura, but not above

the level of the cranium. In the hernia there was a small opening, which led into a cavity about the size of a walnut. This cavity was full of clear fluid, and lying in it were two small pieces of bone ½ in. by ¼ in. These were removed and the wound sutured; a drain was left in for twenty-four hours.

The next day the patient was better, but was still dull and complaining of slight headache.

Recovery was gradual, with occasional headache. He was evacuated to the base a fortnight after the second operation. He was then quite well, showing no effects of his injury. The report received from the base previous to his evacuation to England stated that "there were no ill effects from head injury observed while patient was in this hospital. No symptoms."

The necessity for the examination of the brain for foreign bodies, and their removal, is a subject of some controversy among the surgeons who are working in clearing stations. In their report on gunshot wounds of the head Lieutenant-Colonels Holmes and Sargent state:

It seems extremely doubtful if surgical intervention other than that necessary for the drainage and the healing of the wounds diminishes appreciably the risk of later complications or can modify except in a harmful direction the course of these cases from the functional standpoint.

Our records also show that many patients with foreign bodies lodged deeply in the brain recover, and are scarcely more liable to serious complications than men in whom the brain has been merely exposed and lacerated.

In the case here reported the patient was making an excellent recovery until he was interrupted by a serious relapse, which was relieved by the second operation. If the pieces of bone which were then removed were the

cause of the relapse—and this seems a fair conclusion—it points to the necessity for removal of any such foreign bodies at the first opportunity. If this course had been carried out at the first operation the case would probably have made an uncomplicated recovery.

I should like to express my thanks to Lieutenant-Colonel H. H. Norman, R.A.M.C., for permission to publish this case, and to Captain Richards, D.S.O., for his advice and help.

REFERENCE.

¹ *Journal of the Royal Army Medical Corps*, September, 1916.

COMBINED SUSPENSION AND EXTENSION APPARATUS FOR COMPOUND FRACTURES ABOUT THE HIP.

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SEVERE wounds of the buttocks and wounds of the upper third of the thigh, with high fracture of the femur, unfortunately common in this war, are among the most unsatisfactory that the surgeon has to deal with and the most distressing to the wounded themselves.

As regards buttock wounds, the patients from choice will always lie on their faces; this is the position in which they are sent from the field ambulances to the casualty clearing stations, and at this early stage it is certainly the best. But when, as invariably happens in shell wounds of this region, sepsis is firmly established, the advantages of dependent drainage practically necessitate the patient lying on his back. Pressure on the wound thus produced retards healing and often causes almost intolerable pain. In addition, it makes the dressing of the wound difficult, tedious, and painful, while the same may be said of the use of the bedpan, care of the back, and other details of nursing. Especially is this so when fracture of the sacrum, ischium, or upper extremity of the femur is a

complication. The frequent movement of these fractures for dressing, etc., are, of course, both painful and surgically bad.

Wounds of the upper third of the thigh with fracture of the femur may commonly be put up in a Thomas's leg splint (slung and abducted) quite satisfactorily, but too often the ring of the splint covers some area of the wound, and it is not easy to transport cases thus put up by ambulance train without much harmful and painful movement of the fracture.

The various modifications of the Thomas we have found quite unsatisfactory. The half-ring, for instance, may not press on or cover the wound area, but the splint is extraordinarily difficult to keep in position when the patient is in a bed; during transport it is nearly impossible.

A Jones's abduction frame meets the difficulty when there is an anterior wound only, but when, as generally happens, there is a through-and-through wound, of which entrance or exit is posterior, this is in contact with the padded frame, and is difficult or impossible to dress. The frame has other disadvantages from the army point of view—it is cumbersome and takes up much space in supply trains, and it is expensive.

Experience of these difficulties raised the consideration whether it was not possible to devise an apparatus that should be efficient as a splint and yet be comfortable for the patient; allow free access to the wound and facilitate nursing; be simple of structure and application, easy of transportation when in use; cheap, light, and portable when packed.

We claim that all these requirements are met by the Hodges-Lockwood combined suspension and extension apparatus described below, which was elaborated by Captain A. L. Lockwood, R.A.M.C., and myself, with the very able assistance of Mr. Price, of Down Bros., by whom the splint was made to order of the War Office.

1. As a splint good extension is obtained and also fixation, the loin sling tending to prevent slewing of the body, while abduction can be made to any extent required. It can be adapted to either side.

2. It is perfectly comfortable.

3. Its advantages in dressing and draining of posterior wounds are obvious, and as these are not pressed upon there is an improved chance of rapid healing and less pain to the patient, especially as he does not require moving for any purpose. The use of the bedpan, etc., is easy.

4. Once the patient is in the splint he can be moved on to an army stretcher, which the splint is made to fit, and to which it can be firmly fixed. In this way he can be transported by ambulance or by train to the base, or by ship to England without in any way disturbing his fracture.

5. Packed, the splint measures 36 in. by 36 in. by 9 in. Its lightness, simplicity of structure and application, will be obvious from the following description, which is issued with the splint.

The splint consists of an iron cradle which is passed round the patient at about the level of the umbilicus. At right angles to this cradle is attached a second cradle which passes vertically between the patient's thighs. To this again is fixed (1) a cross-bar to give support when the apparatus is on a stretcher, and (2) a modified form of Thomas's leg splint supported at the foot end by a folding upright. This leg splint (made to fold for purposes of packing) is attached to the transverse cradle on the outer side by a short bar, adjustable as to length, and to the second cradle by a slotted bracket and thumbscrew. A stout canvas sling is attached to the transverse cradle by straps and buckles, and suspends the patient's lumbar region and perhaps just the upper part of the sacrum.

A second sling is attached to the second cradle and to the outer adjustable bar to take the weight of the thigh just below the natal fold.

A third sling is fixed to the leg splint near the foot.

The head, shoulders, and opposite leg being suitably

supported, the patient can be raised by means of these slings 6 in. or more above the bed.

Fixation is obtained by means of a padded perineal band strapped to the transverse cradle above and below him.

Extension is obtained in the way usual on a Thomas's leg splint.

Abduction.—By the adjustment of the short outer bar any required abduction can be obtained.

The diagram shows the patient with apparatus in position.

Method of Application.

1. Place the transverse cradle in position at about the level of the umbilicus, passing it over the patient's head and shoulders.

2. Push the second cradle into position, passing it between the patient's thighs as shown in diagram, and fix above and below to the transverse cradle by the thumbscrews—but not tightly.

3. Slide the leg splint under the limb and attach the semicircular ring to the second cradle.

4. Fix the short outer bar in position (roughly).

5. Raise the patient by means of the slings, at the same time supporting the head, shoulders, and opposite limb on pillows or half mattresses (biscuits).

6. Fix the perineal band.

7. Apply the necessary extension.

8. Abduct the limb as required by adjusting the short outer bar.

9. Tighten the thumbscrews connecting the two cradles.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

RECURRENCE OR REDEPOSIT OF CANCER: WHICH?

In your issue of March 24th Mr. Mansell Moullin relates the case of a lady upon whom he performed gastrectomy for carcinoma of the stomach, and who died "seven and a half years after the original operation, for seven of which she had enjoyed perfect health." He states that "the whole liver was full of small nodules of an unmistakable character." I should like to add very brief notes of two cases of late recurrence or redeposit of laryngeal cancer.

The first was a man who had an epithelioma of the left vocal cord. The diagnosis was confirmed by Sir Felix Semon, and by microscopic examination after operation. I removed the growth by laryngofissure, and the patient enjoyed perfect health for thirteen years. I was then called to see him one evening because of urgent dyspnoea. He was cyanosed, laryngeal stridor was very obvious, and both lungs were congested. It was obvious that while an immediate tracheotomy might prolong life, it was improbable that it would be successful owing to the serious condition of his general symptoms. A tube was inserted, but the patient died a few hours afterwards. Permission was obtained to remove the larynx only. This showed that the scar of the original operation was perfectly healthy, while a fresh cancer had developed in the right, or originally healthy, cord, and that this growth had been the cause of the final laryngeal obstruction. The specimen is in the museum of University College Hospital, and further details of the case may be found in the *Journal of Laryngology* (September, 1903, p. 473).

The second case was originally operated on by Sir Felix Semon for malignant disease of the left vocal cord, and fourteen years later (after Sir Felix had retired from practice) the patient was referred to me for increasing dyspnoea. The larynx was reopened (laryngofissure) and I found such extensive recurrence that in view of the patient's age and general condition only as much of the disease was removed as seemed possible at the time, and the tracheal cannula was allowed to remain. In the course of a few months the growth spread into the trachea, appeared around the tracheotomy opening and assumed such dimensions that a long spiral König's cannula was necessary to reach below the cancerous mass in the windpipe. Eventually he died from pulmonary complications. Here again we have a patient who enjoyed perfect health and immunity from his disease for nearly fourteen years after the primary operation.

I have records of three other cases in which recurrence