A "CAGE" SPLINT FOR FRACTURES OF THE HUMERUS.

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THE splints that experience has shown to be of value in the treatment of fractures of the humerus at a casualty clearing station are the following:

1. *Surgeon-General Sir Anthony Bowlby's splint*, shaped like the letter P lying on its side, and composed of a rubber-covered iron loop made to pass over the shoulder and attached to a wooden bar for the support of the forearm. This splint is useful for fractures of the upper part of the shaft, but is difficult to keep in position.

2. *Clarke's F-shaped splint* is made with a long horizontal bar supporting the forearm, and an additional piece of wood hinged on to the internal vertical part to give support posteriorly. This splint is extremely useful where there is great loss of tissue and the bone is severely comminuted. Irrigation can be readily performed, the wound can be easily inspected at frequent intervals without disturbing the patient, and where the onset of gas gangrene is expected the wounds, unless posterior, can be exposed to the air or sunlight if desired.

3. *Lieutenant-Colonel Robert Jones's Modified Thomas's Arm Splint*.—Neither the straight nor special bent form has been used owing to unsuitability for travelling.

4. *Captain Max Page's Aluminium Splint*.—This closely resembles Sir Anthony Bowlby's iron and wood splint, but is less rigid.

5. *Lieutenant-Colonel G. M. Giles's Metal Splint*.—This splint was recently described,¹ and presents one important feature also seen in the splint described below—namely, a firm metal loop passing over the acromion, fastened under the opposite axilla, and thus forming a fixed point from which extension is made. The splint, however, is made from materials not at hand in a clearing station, and takes "less than an hour" to manufacture.

The Cage Splint.

Having tested the above-mentioned splints by a considerable experience, I have for several months past used a splint of my own device, which, in addition to the advantages of the several splints mentioned above, presents many of its own. It is very light, and supports the upper limb completely, allowing ready access to the wounds. In most cases the patient can be evacuated as a sitting case, and moves about without pain or discomfort. The splint can be put together in a few minutes by an intelligent orderly from the aluminium splinting, abundance of which is always available. It is useful for all fractures of the humerus, more especially for those of the lower two-thirds of the shaft, also for severe fractures of the elbow-joint and extensive wounds of the upper part of the forearm.

The details of construction of the splint can be readily seen by reference to the figure. A bar of aluminium splinting, 3 feet long (12 "divisions") is bent with the fingers to follow the outer curve of the shoulder, arm, and elbow. In an average patient this will bring the eighth rivet (counting from above) immediately beneath the olecranon. From this point, using the groove provided on the top of the fracture box for the purpose, a rectangular bend is made to carry the rest of the bar forwards along the ulnar border of the forearm. This curve is made away from the middle line of the body, and therefore fits a right or left arm as required.

Splint applied; dressings not shown.

The splint is completed by two short pieces, 9 in. long, connected by transverse pieces of aluminium tape 12 in. long, which are passed between the third, fourth, and fifth rivets of the long bar, and thus form a cage which wraps round and encloses the arm. Similar pieces, 12 and 10 in.

¹ Described and figured in the *Memorandum on the Treatment of Injuries in War*, 1915.

respectively, are connected to the last foot of the bar, and form a cage for the forearm.

In the *Royal Army Medical Corps Journal* of March, 1916, there is a description of this splint as originally devised, without the forearm attachment or "cage." With this cage it is found that extension is easier to apply, and that there is greater rigidity and comfort to the patient.

Application.

The application of the splint is simple, and takes but a few minutes. In cases of compound fractures, the wounds having been carefully dealt with under an anaesthetic and drainage having been established, etc., the dressings are applied in such a way that a sufficient clean area is maintained, and at the same time the gauze in immediate contact with the wounds can be changed through the "windows" of the cage, with the minimum amount of disturbance.

The shoulder-piece is fixed over a sufficiently thick pad of wool, and kept in position by tapes passing under the opposite axilla. Next, the upper cage is fitted closely round the arm, and the whole bandaged. The forearm is finally put up in any desired position. If the musculo-spiral nerve is damaged, the hand and wrist may be maintained in a dorsiflexed position by suitable adjustment of the lower cage.

In simple fractures care must be taken to preserve sufficient extension at the elbow.

The question of the position of the forearm with relation to the trunk must be considered. The patient is undoubtedly more comfortable for his journey with the forearm supported across the front of the chest, but in the majority of cases the lower fragment is rotated at right angles to the upper. The best position must be decided for each case individually and controlled by skiagrams.

The splint is approved by Colonel Cutlbert Wallace, A.M.S., and is used extensively by my colleague Lieutenant A. C. Bryson.

Conclusion.

In conclusion, I should like to point out the importance of the system of aluminium splinting to those surgeons in hospital and private practice who are not yet acquainted with it. No hospital splint room will in future be completely equipped without a supply of the material, and, moreover, speaking from the experience of many of my friends and myself, few surgeons will in future care to be without the aluminium splinting material for their private work.

REFERENCE.

¹ BRITISH MEDICAL JOURNAL, December 4th, 1915.

THE INHIBITORY ACTION OF SALIVA ON GROWTH OF THE MENINGOCOCCUS.

BY

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IN March, 1915, when teaching some pupils to recognize colonies of the meningococcus in plate cultures made from material taken from the nasopharynx, it was thought that a simple method of demonstrating the first step in the identification of this micro-organism would be to mix a suspension of it with saliva, and to make a plate culture from the mixture.

This, accordingly, was done. It was found, however, that whereas numerous colonies of salivary bacteria, chiefly streptococci, developed, no colonies of the meningococcus appeared. A plate culture made at the same time from the meningococcus suspension yielded numerous colonies of this micro-organism. Clearly, then, in this instance, the saliva had inhibited growth of the meningococcus.

As Captain Colebrook of St. Mary's Hospital had recently shown me his discovery of the inhibiting power exercised upon the growth of the meningococcus by a Gram-positive coccus which he had found to replace the meningococcus in the nasopharynx of a carrier when the latter became "free," it occurred to me that possibly the present phenomenon might be an instance of a similar action. Equally, however, it might be due to some inhibitory