FROM OSLO KOMMUNALE LEGEVAKT
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CONSERVATIVE TREATMENT OF CLAVICULAR FRACTURES

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According to Kreisinger, more than 200 methods of treating clavicular fractures have been described. This fact alone proves that the problem of how to obtain perfect results in treating clavicular fractures is not a simple one to solve.

I personally have never seen any bad results from operative reduction and fixation of the fracture if the foreign material used for the fixation is removed after consolidation of the fracture, but certain complications have been described in the literature and undoubtedly opening a fracture situated so close to the large vessels and nerve trunks is not without risk of complications. Moreover, the presence of unresorbable matter so near to the surface of the skin may cause irritation.

It is, therefore, not surprising that one often finds warnings against routine operation on clavicular fractures from the most experienced traumatologists, as, for example, Watson Jones. There will, however, always be certain clavicular fractures in which operation is necessary to avoid a decrease in the patient's working capacity. In order to reduce the number of operations to as few as possible it is necessary to find a very secure conservative method of fixing the fracture. The main problem in the treatment of clavicular fractures, excepting transverse fractures which may also be difficult to reduce, is how to fix the broken ends.

It is said that clavicular fractures almost always unite, and that, even though the ends are in a bad position, at least a fibrous, if not a bony union takes place. This is, however, not completely accurate, as one does see cases without either fibrous or bony union and where the patient is unable to do heavy work or sport, until the condition is changed. Further

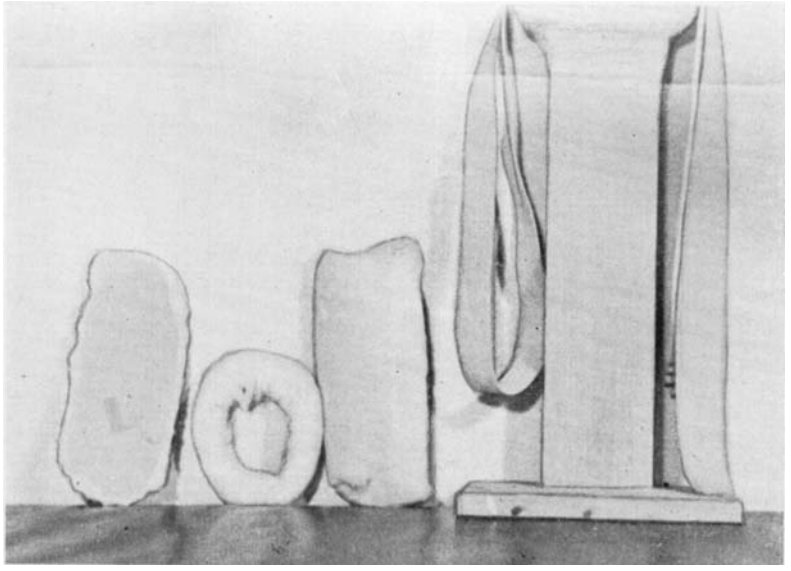

Fig. 1.
Two preces of cardboard, one padded, the other unpadded.
One cottenwool-ring. The bar and the belt.

in the clavicular fractures which eventually unite, the process may be so slow, if the fracture is not properly fixed, that a patient who earns his living by heavy work may have serious economic difficulties.

To avoid such complications, I have since 1935 used a plaster method which I will describe here.

In my experience, two things have prevented more extensive use of plaster of Paris bandages in clavicular fractures. First, the difficulty of holding the fractured ends in position during the application of the plaster, and second, the discom-

Fig. 2.
The ring and the belt are applied to the patient.

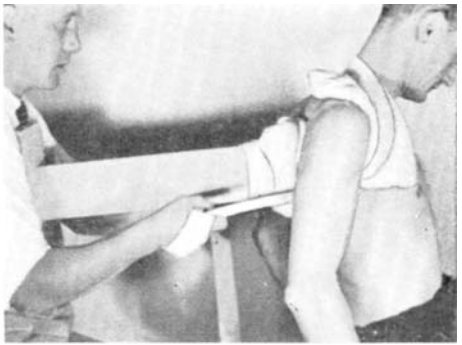

Fig. 3.
The bar has been placed between assistant and patient.

Fig. 4
showing how the bar has been placed over the plaster slabs crossing the back.

Fig. 5.
Front view of the finished bandage.

Fig. 6.
Side view.

fort caused to the patient by the figure-of-8 bandaging usually recommended, which compresses and constricts the axillæ. I have tried to overcome these disadvantages by the technique described below.

Fig. 7.
Showing hands meeting in front.

Fig. 8.
Back view.

Fig. 9.
Range of elevation of arms.

Small children can usually be treated successfully by figure-of-8 bandages of flannel. But here also one must be very careful to avoid constricting the axillæ. Older children are treated in the same way as adults—either, in less serious cases by a kind of bridle bandage, which is excellent, or by a plaster of Paris bandage.

A plaster bandage improves the cosmetic result in two ways. Firstly, it maintains the complete or partial reduction and prevents gradual loss of the position while the ends are uniting. Secondly, the callus formation is less bulky with good fixation.

For the application of my bandage, one needs a fairly tightly bound ring of cotton wool, a belt, two oblong pieces of cardboard padded with cotton wool, a bar with a supporting plate at one end and a pressure knob at the other, and three long and one short plaster of Paris slabs. Two assistants are needed.

The pieces of cardboard are prepared by tearing off the edges so that they lose all sharpness. The cardboard should

not be too thick and must be pliable. The prepared pieces are padded and placed over the anterior circumference of the shoulders so that they reach from the trapezius muscle to a little below the axillary fold. The large vessels and nerves in the axilla are thus protected against pressure from the plaster. At first I used only thick saddle felt under the plaster slabs instead of cardboard, but it failed to protect the axillae.

Before reducing the fracture the ring of cotton wool is attached to the skin between the shoulder blades with a solution of mastix. The fracture is then reduced in the ordinary way under local anesthesia, using 10 cc of a 1 per cent Novocainadrenaline solution. The assistant then takes charge of the patient, and sits behind him, while the bar is placed between them, with the supporting plate against the assistant's chest and the pressure knob against the padded ring between the patient's shoulders.

Now, while the assistant pulls back the patient's shoulders or upper arms, using the bar as counter pressure, the surgeon places the cardboard on the shoulders, and passes the belt behind the neck, forward over the shoulders and back under the axillae to the assistant who now takes the two ends of the belt and pulls backwards with them instead of with the shoulders themselves. Then, while the fracture is held in correct position, the operator carries out any minor local corrections at the site of the fracture. The belt forces the patient to bend his head while the plaster is applied, and this position probably helps to reduce the fracture and keep it reduced since it relaxes the sternocleidomastoid muscle, which tends to displace the medial fragment slightly upwards.

When the patient's position is satisfactory, the first plaster slab is placed round the thorax below the nipples. The other two plaster slabs should be a little longer. They are applied from the posterior lateral region of the circular plaster slab across and up the back to the front of the opposite shoulder, so that they cover the belt and the cardboard, and then under the axilla, back to be attached to the first slab. When the plaster slabs are passed across the back, the knob of the bar

must be lifted away for an instant by another assistant, who first grasps the patient's head and then the bar and presses them gently apart, while the first assistant slightly relaxes the pressure of his chest on the supporting plate. It is best to begin with the affected side. A depression in the plaster is thus produced under the knob of the bar, it does not, however, cause any discomfort to the patient because of the padded ring, but exerts a light pressure between the shoulder blades and tends to correct the fracture. To avoid secondary displacement of the fracture a short plaster slab is placed across the chest to prevent approximation of the plaster loops. Finally, the slabs are fixed by a few turns of plaster bandage. It is best to twist the slabs as they pass under the axillae, so that they are stronger and narrower here. The belt is now removed, and plaster is cut so that the patient's hands can meet in front, and the plaster does not irritate. If necessary, minor corrections for the final adjustment of the plaster should be made in the next few days.

SUMMARY

Due to the fact that clavicular fractures with considerable displacement sometimes take a long time to consolidate, and that in certain cases even a pseudarthrosis may develop, because of insufficient immobilisation of the fracture by soft or semi-rigid adhesive tape or bridle bandages, the author has since 1935 used his own plaster of Paris bandage, which is mainly shaped like a shoulder bridle.

The reasons for the difficulties of using plaster of Paris in clavicular fractures are discussed and their avoidance with the new technique is described.

In order to immobilies the fracture while the plaster is being applied a bar with a supporting plate and pressure knob and a belt are used. The bar is pressed between the patients shoulder-blades, and the same assistant who presses on the bar pulls the shoulders back with the belt. Padded cardboard is applied to protect the nerves and vessels of the axillæ.

RESUME

En partant du fait qu'il faut souvent un temps assez prolongé pour arriver à la réduction définitive d'une fracture de la clavicule avec forte dislocation, soignée seulement par emplâtres mous ou demi-solides, ou avec des bandages en forme de brides, et que dans certains cas il se forme même de la pseudarthrose, l'auteur s'est, depuis 1935, servi d'un bandage de plâtre de son modèle.

Les causes des difficultés qui surgissent en employant le plâtre pour ces fractures ont été discutées, et il est décrit comment on peut éviter ces difficultés en ayant recours à la nouvelle méthode.

Le bandage conserve, en principe, la forme d'un bandage-bride, et on l'applique à l'aide d'un instrument très simple, un bâton en bois avec une pelote de pression et une plaque de soutien. On se sert, en outre, d'une ceinture. Ces deux objets sont employés pour la coaptation de la rupture pendant le plâtrage, un aide rentrant les épaules avec la ceinture en pressant le bâton entre les omoplates. Pour protéger les vaisseaux et les nerfs de la région axillaire, on applique des plaques en carton, flexibles et ouatées, placées d'une manière bien déterminée.

ZUSAMMENFASSUNG

Ausgehend von der Tatsache, dass es in Fällen von schwereren Schlüsselbeinbrüchen manchmal lange dauert bevor sie fest werden und dass es manchmal sogar zu Pseudarthrosen kommt, wenn man nur mit weichen oder halbsteifen Pflaster oder Turnisterverbänden zu fixieren sucht, hat der Verfasser seit 1935 eine eigene Methode der Gipsverbandbehandlung angewendet. Die Bandage hat im Prinzip die Form eines Turnisters.

Die Gründe fuer die Schwierigkeiten in der Verwendung von Gibsbandagen beim Schluesselbein-bruch sind erörtet und ihre Vermeidung mit der neuen Methode ist beschrieben.

Um die Bruchenden während des Gibsens zu fixieren,

vewendet man einen Stab mit einer Druckpelotte und einer Stützplatte, ferner einen Gürtel. Der stab wird vom Assistenten zwischen die Schulterblätter des Patienten gedrückt, während der Gürtel vom selben Assistenten benützt wird um die Schultern des Patienten zurückzuziehen. Zur Beschützung der Nerven und Gefässe in den Axillae verwendet man dünne, wattierte Pappendeckelscheiben.

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DISCUSSION

Wallgren.