

point on Poupart's ligament. This helps to keep the area flat and to prevent any bulging which gives a hernia a start.

The operation for hernia is much more serious than it is generally considered. When we consider that many are done on working men who are having the operation done at considerable expense of time, every effort should be made to give them the best possible result. The more difficult types should be done by the more experienced surgeons.

DR. CHARLES A. PORTER, Boston: There is a joke that Dr. \_\_\_\_\_ of \_\_\_\_\_ found that the senior men had the most recurrences and the younger men the least.

DR. SAMUEL W. GODDARD, Brockton: I would like to emphasize another point, and that is, the importance of getting equal tension on all sutures, so that when pressure is exerted from within, the pressure may come against them all as a whole, equally, and not on a few.

DR. DAVID CHEEVER, Boston: I have listened with the greatest interest to Dr. French's paper and I think he is to be congratulated on his excellent statistics from the Fall River Clinic. His cases include some operated on as recently as six months ago, and while I do not wish to be pessimistic, I must say that few of the recurrences that have come under my observation have occurred within six months, and I suppose therefore that there are bound to be more among his cases later on. Most of the recurrences in my own experience have come after two or three years.

Especial emphasis has been placed both by Dr. French and Dr. Jones on the importance of painstaking care in technique of operating and of a knowledge of regional anatomy, and I am glad to take this opportunity, as I wished to also at the close of Dr. Lahey's paper, reporting 20-odd per cent. of accidental sections of the musculospiral nerve in dissections of the neck, from the City Hospital Clinic, to make a strong plea for the necessity of an accurate familiarity with anatomy. There has been no more harmful doctrine promulgated by a certain group of surgeons than that a knowledge of anatomy is relatively unimportant in surgery, and that a surgeon can learn his anatomy at the operating table. Doubtless many of these cases of accidental nerve injury were at the hands of junior men, and while some such injuries are inevitable the liability to them is much increased if the operator is not absolutely familiar with the anatomy involved. In the same way, recurrences after hernia operations may sometimes be explained on similar grounds. But you cannot make a silk purse out of a sow's ear, and if you are not dealing with good, sound tissues, the percentage of good results will be much smaller, and I have no doubt that in most of the hernias that Dr. French and Dr. Truesdale have operated upon, with subsequent recurrence, there has been little to work with.

Going back to the conception of anatomy as the great underlying factor in the success of operations for hernia, the operator should have very definite principles and ideals for every step of the operation: For instance, in the treatment of the sac in indirect hernia he should not ligate or cut away the sac until he has carried out the dissection of its neck to the level of the deep epigastric artery. The vessel should be clearly demonstrated, and the neck of the sac transfixed and ligated at that level at least, or higher, if possible. The artery lies just extraperitoneally, and after the ligation and removal of the sac, there should not even be a dimple left, if it could be looked at from the intra-abdominal aspect.

I agree with Dr. Jones about the folly of invariably opening the sac in direct hernias. Too often

the sac is operated and it is found on attempting suture that there is really not sac enough to cut away. What has been done, therefore, is practically useless, and some form of plication is the best thing to do. Incidentally, the presence of the urinary bladder should be suspected in every direct hernia and it is occasionally accidentally opened, and this accident would be avoided if the peritoneal protrusion is plicated rather than opened.

Concerning the transplantation of the cord outside the external oblique and the covering of the cord with the lower segment of the aponeurosis, that seems to me unnecessary. It is apt to be too much compressed by this flap and a wide imbrication and adhesion of the apposed surfaces is not obtained unless the lower flap is smoothly sutured to the upper segment of the aponeurosis, whose edge has been brought down to Poupart's ligament, without effort to cover in the cord. The latter will lie just as comfortably between the layers of the superficial fascia, and I believe that it is just as safe there from trauma as it would be in its deeper position. I think this is the operation of choice in primary operations for hernia when you are dealing with poor tissues, and the best operation when you are dealing with most recurrent hernias.

DR. RALPH W. FRENCH, Fall River: I am glad Dr. Jones brought out the point about the transversalis fascia which will add security to the procedure. Herniotomy is a most interesting subject. Each recurrent hernia is a little different from the last one, and this fact makes each case a separate interesting problem.

## Original Article.

### FRACTURE AND DISLOCATION OF THE CERVICAL VERTEBRAE WITHOUT PARALYSIS. REPORT OF A CASE.

BY WILLIS E. HARTSHORN, M.D., NEW HAVEN, CONN.

INJURIES to the cervical vertebrae are of comparatively frequent occurrence. They result fatally in a rather large percentage of the cases. Owing to the fact that the spinal canal in the cervical region is somewhat larger than in other portions of the column, there is a greater range of mobility to the cord in this region. It is for this reason that a certain number of these cases, even when associated with fracture and dislocation of the bony framework, do not cause the death of the patient. Occasionally, comparatively few symptoms suggesting pressure on the cord are present, at least in the earlier stages following injury.

A certain similarity exists between fractures of the skull and fractures of the vertebrae. Both the brain and the spinal cord are encased in a bony, protective framework and constitute essential parts of the same system.

Broadly speaking, two main divisions may be considered: the type with paralysis and the type without paralysis.

Injuries to the spinal cord might be classed as follows: (1) Concussion. Associated with this may be a temporary paralysis. (2) Trauma, with intraneural or spinal hemorrhages. In

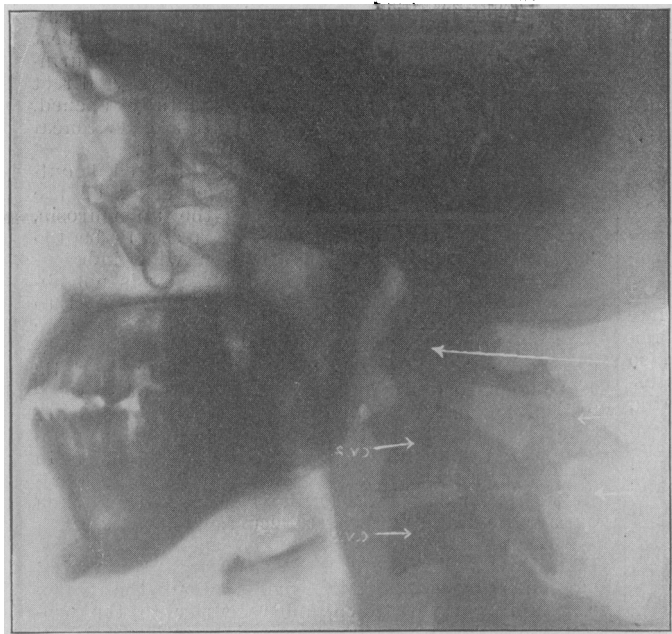


FIG. 1

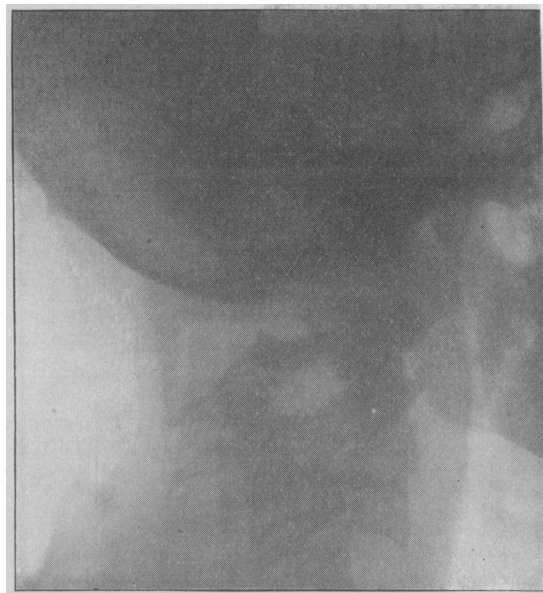


FIG. 2

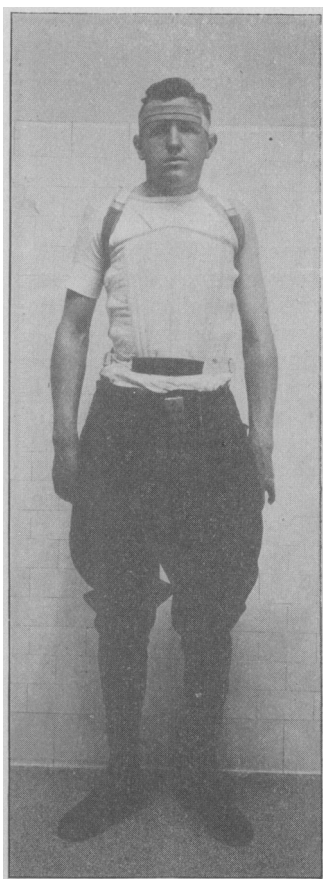


FIG. 4



FIG. 4

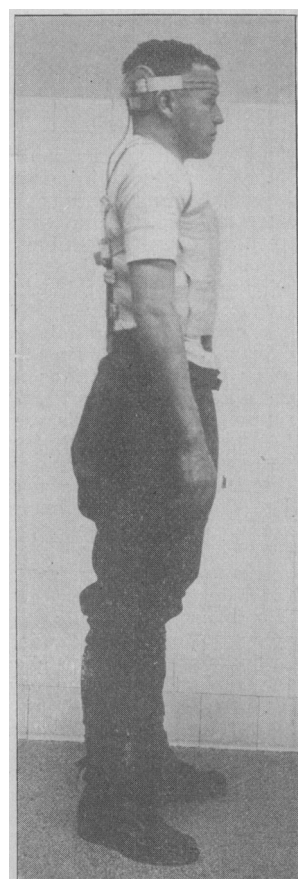


FIG. 4

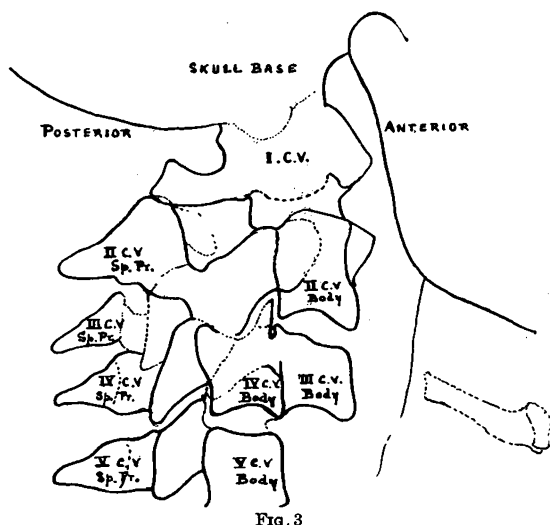


FIG. 3

this case the paralysis may be present for a considerable period in certain groups of muscles, and gradually disappear. (3) Injuries to the cord from fragments of the bony framework, with resulting pressure symptoms or laceration of the cord with destruction of tissue. (4) Pressure on the cord due to dislocation of the vertebrae without fracture. (5) Fracture and dislocation of the vertebrae without injury to the cord. (6) Compression frac-

tures of the bodies of the vertebrae. Any of these lesions may, if recovery takes place, present a later stage associated with painful neuralgias due to pressure from scars or callus formation and to actual deformities which have been typed under the general heading, "Kummel's Disease," and may present themselves as an actual kyphosis at the focus of injury to the bodies of the vertebrae.

The prognosis depends upon the degree of paralysis. If this is extensive, even with operative interference the outlook is very poor. If not extensive, recovery is more probable. Removal of bony fragments pressing on the cord is always advisable when moderate grades of paralysis are present. If dislocation alone is noted, without fracture, but with paralysis of greater or less degree, it is advisable to attempt extension of a rather forcible character by manipulation. A number of cases have been reported in which reduction has been readily accomplished without accident. The greatest care must be exercised while making the attempt, and all unnecessary trauma avoided. The attendant risks should be carefully explained to the patient.

The following case, from the writer's service at the New Haven Hospital, is presented as it combines the rather unusual features of a severe fracture and dislocation, without paralysis.

Name—E. M. Age—20. Admission Number—63136. Occupation—Soldier. Admitted August 11th, 1917. Discharged November 2nd, 1917. Diagnosis—Comminuted fracture of the second and third cervical vertebrae. Anterior dislocation of the first, second and third. Complaint—Multiple contusions of head, neck and left shoulder. Present Illness—Patient was hit by locomotive while walking on railroad tracks. Was brought to hospital in deep shock.

Physical Examination: Head—There are lacerated wounds of the scalp over the parietal and occipital region. No depression fracture noted. Eyes are normal, respond to light and accommodation. Jaws are intact. Uvula is in midline. Cervical Region—Swollen and painful, posteriorly. Marked deformity. Thorax—Clavicles are intact. No fractures of the ribs. No injuries to lungs. Right Upper Extremity—Normal movements. Sensory reactions undisturbed. Left Upper Extremity—Very marked swelling over deltoid region, with severe lacerations. Patient is able to move arm to moderate degree. Rotation is without pain. Abduction limited to 90°. No crepitus. Suggests hematoma beneath skin. Head of humerus apparently in position. Extremity is not paralyzed. Abdomen—No distention; no rigidity; reflexes undisturbed. Right Lower Extremity—No paralysis. Left Lower Extremity—No paralysis.

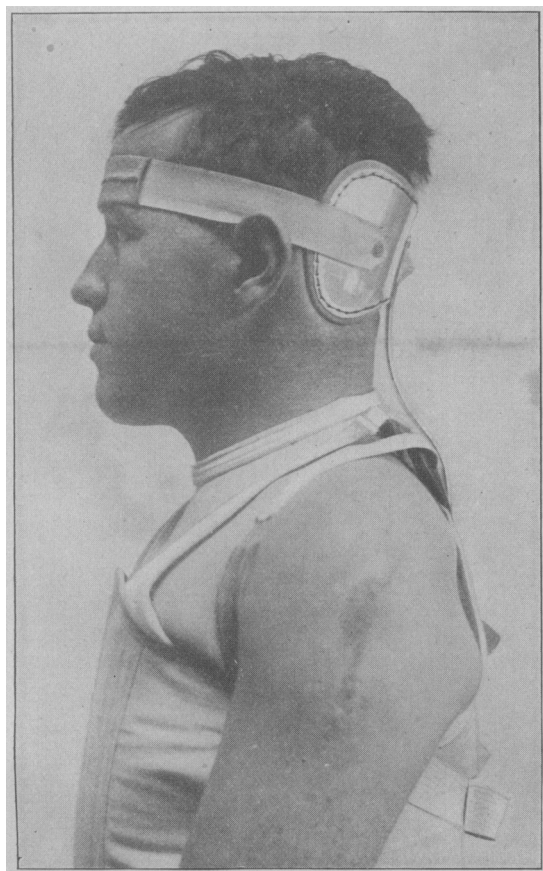


FIG. 5

August 16th, 1917—No paralysis of extremities. A number of small vesicles on the chin suggest atrophic changes. Pupils are equal and respond to light and accommodation. Sphincters intact. Marked fullness over cervical region posteriorly. Head lies in same axis as trunk.

Dr. Max Mailhouse, Neurologist, August 18, 1917.—Apparently no paralysis in right shoulder muscles, arm, forearm or hand. Muscles that elevate shoulder have lost power on left side. Pronounced herpetic eruption on neck. Sympathetic reacts well on both sides. Too high for sympathetic involvement. No involvement of central canal. Can move lower extremities. Plantar reflexes present, but not lively. Muscle sense normal. Knee-jerks present, but not lively. Achilles-jerk present on both sides. No incontinence. Abdominal reflexes present. Better on right than on left. Takes a good deal of force to bring them out. Sensations normal here. Grip good in both hands.

August 26th, 1917.—No paralysis. On palpation, the deformity in the posterior cervical region is not marked. September 9th, 1917—Tender point over mid-cervical spine, but no swelling. No paralysis. Motion of left shoulder gradually returning. September 14th, 1917—Patient is able to sit up on back-rest. November 2nd, 1917—Discharged. Has been up and around the ward for several weeks. Can walk without difficulty. Still has some paresis of left deltoid, with atrophy. Neck not absolutely rigid. Wears brace for neck.

#### REPORT OF X-RAY EXAMINATIONS.

August 15th, 1917—No dislocation of the head of the humerus. There is, however, separation of the left clavicular-acromion juncture. August 16th, 1917—No dislocation of the head of the left humerus. Forward displacement of the atlas. Forward displacement and fracture of the second and third cervical vertebrae. The fracture is semi-longitudinal, apparently, through the arches of the vertebrae and also through the laminae. The spinous processes are approximately in position. October 24th, 1917—X-rays taken as the patient was about to be discharged. show no change in the last examination. Detailed structure is perhaps a little clearer. Figures one and two show radiographs. Figure three shows x-ray tracing.

Treatment—Advisability of forcible extension considered by consultants, but discarded as dangerous. Moderate traction applied in order to secure proper splinting of head and neck. Extension carried over head of bed. Moderate rigidity of head and neck secured by sandbags. On leaving bed, application of mechanical support, as noted in Figures four and five.

Six months after discharge the patient reported for examination, with the following findings: No paralysis; no secondary neuralgias; marked stiffness of neck.

## Medical Progress.

### PROGRESS IN SURGERY.

BY EDWARD H. RISLEY, M.D., WATERTOWN, ME.

LILIENTHAL describes, in *Annals of Surgery* for September, 1921, his extrapleural resection and plastic operation for carcinoma of the oesophagus.

This is an entirely new operative procedure of a decidedly major character and has as a part of its technic the introduction of a rubber tube reinforced with a large skin flap to replace the resected diseased area.

The article is well illustrated with x-ray photographs of a successful case. It also contains the histories of four other cases operated on by this method.

The author concludes from his experience that transpleural resection of the oesophagus has a forbidding mortality: that fatal infection follows the primary opening of the oesophagus within the mediastinum: that it is feasible to make an extra-pleural exposure of the posterior mediastinum large enough to permit the operator to see clearly and to work safely with both hands in the wound; that resection of the oesophagus in the posterior mediastinum can be done by dividing the operation into two stages; at the first the oesophagus is freed from its attachments and the mediastinum is sealed; at the second, ten to fourteen days later, the resection is performed.

The article contains a complete bibliography on this subject.

#### HIGH TRACHEOTOMY AND OTHER ERRORS THE CHIEF CAUSES OF CHRONIC LARYNGEAL STENOSIS.

JACKSON, CHEVALIER, (*Surgery, Gynecology and Obstetrics*, May, 1921) writes as follows:

1. The most frequent cause of chronic laryngeal stenosis is high tracheotomy.
2. While in a given case no one has any right to say that the operation that saved that patient's life was an unjustifiable one; yet, equally rapid methods being available, high tracheotomy should not be taught.
3. The classic distinction between a high and low tracheotomy with reference to the isthmus of the thyroid gland is a relic of the days when too much respect was had for the thyroid gland, or at least for its isthmus, and the distinction should be abandoned. The vitally important matter of where the trachea should be incised should not depend upon the negligible isthmus. There should be taught only one tracheotomy and that should be low.
4. The trachea should always be incised lower than the first ring except in those rare cases in which laryngoptosis renders this impossible without entering the anterior mediastinum.
5. The cricoid cartilage should never be cut unless laryngoptosis places all the rings of the trachea below the upper border of the manu-