A further case of removal of the upper extremity together with the scapula and clavicle / by A.J. Ochsner.

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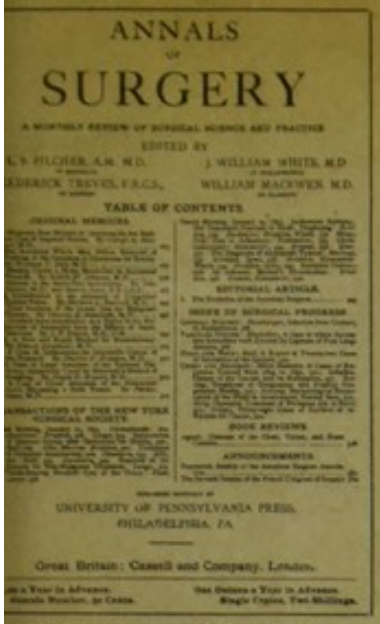
ANNALS
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A MONTHLY REVIEW OF SURGICAL SCIENCE AND PRACTICE

EDITED BY

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TABLE OF CONTENTS

ORIGINAL MEMORIES

EDITORIAL ARTICLES.

DIGEST OF SURGICAL PROGRESS

TRANSACTIONS OF THE NEW YORK SURGICAL SOCIETY

BOOK REVIEWS

ANNOUNCEMENTS

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14

A FURTHER CASE OF REMOVAL OF THE UPPER EXTREMITY TOGETHER WITH THE SCAPULA AND CLAVICLE.

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A FURTHER CASE OF REMOVAL OF THE UPPER EXTREMITY TOGETHER WITH THE SCAPULA AND CLAVICLE.

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FOUR years ago I reported a case of removal of the entire upper extremity for osteo-sarcoma originating in the upper extremity of the humerus and extending to the tissues of the shoulder-joint.

The patient was a slight, anæmic young woman nineteen years of age. She gained rapidly in weight and strength after the operation and has remained in perfect health ever since, supporting herself well by retouching photographs with her left hand. She is now a beautiful, robust woman, married since about one year.

My second case, a Swedish laborer, forty-six years of age, was kindly referred to me by Dr. Blackman, of Geneva, Ill., about the last of April, 1894. He had at this time two hard, slightly nodulated tumors in the region of the supraspinatus muscle and at the end of the clavicle respectively; the former being one and a half inches in diameter and two and a half inches long, the latter about an inch in every diameter.

The tumors had given rise to no pain and had been discovered accidentally about two months before. In the mean time they had increased considerably in size.

I advised the immediate removal of the growths. The patient returned to his home and did not reappear until May 30, 1894.

He was in a severely intoxicated condition, so I postponed the

operation for two days, limited him to a liquid diet, administered two ounces of castor oil twice in order to assist in the elimination of waste products, and gave him an abundance of water to drink for the same purpose.

The tumor had nearly doubled in size during these five weeks, which still further confirmed my diagnosis of sarcoma. The patient had always been thin, and of late he had become very anæmic, but his general condition indicated that he was a man of considerable endurance.

He had worked for years as a section hand repairing the road-bed and replacing worn-out rails on a railroad line. He was out-of-doors constantly, without regard to weather, shovelling sand and gravel and carrying heavy steel rails. He supposed the latter part of his occupation to have caused the growths, although he could not remember of having been injured at any time. His health had always been good and he has a large family of healthy children. Occasionally he had taken whiskey to excess, but beyond this he was a man of good habits. On June 1, 1894, I proceeded to operate, the patient being anæsthetized with chloroform, ether being administered during the progress of the operation after complete narcosis had been established.

In order to be more positive concerning the diagnosis an incision was made into the larger tumor, showing it to be an enchondro-sarcoma, which had undergone colloid degeneration at several points.

This diagnosis was later confirmed by Dr. E. R. LeCount, pathologist at Rush Medical College, whose report I shall append to this paper.

It is a well-known fact that sarcomata originating in the humerus, scapula, or clavicle in the vicinity of the shoulder-joint are certain to recur unless all of these structures are removed. The indications were consequently unmistakable in this case.

The prognosis was relatively favorable because of the considerable distance between the tumors and the remaining tissues of the body after the completion of the operation.

With the aid of the excellent staff of assistants at the Augustana Hospital, and Dr. Frank Jay, who had assisted me at the previous operation, I was enabled to complete the entire task in less than three-quarters of an hour from the first incision until the completion of the dressing.

I again followed the steps laid down by Paul Berger almost exactly.

An incision was made over the clavicle, the periosteum reflected, a broad, blunt instrument inserted between the periosteum and the clavicle at the junction of the internal and middle third. One blade of a pair of bone-cutting forceps was inserted between the clavicle and the retractor, and the former was easily severed.

The outer portion of the clavicle was now elevated, the blunt instrument being left in place to support the periosteum and the underlying vessels. The subclavian artery could now be felt pulsating underneath the periosteum, and lifting the latter together with the subclavian muscle the dilated vein was plainly exposed at a point directly in front of the middle scalenus muscle. The brachial plexus was easily separated above by means of blunt dissection with the finger.

A catgut ligature was now passed around the artery and vein by means of fine blunt hæmostatic forceps. A silkworm-gut ligature, which had been rendered perfectly soft and pliable by immersion in hot water, was passed around the vessels in the same manner, at a point a quarter of an inch above the catgut ligature. After tying both carefully, forceps were applied to the vessels an inch below and the latter severed between forceps and ligature. Now the flaps were formed by carrying the incision forward and downward to the middle of the axilla from the outer end of the original incision. A second incision was carried backward over the outer third of the scapula and downward to meet the anterior incision in the axillary space. The skin-flaps were dissected up rapidly, and then the soft tissues were severed rapidly first anteriorly and then posteriorly along the surfaces of the ribs, all bleeding vessels being caught instantly with hæmostatic forceps.

There was almost no blood lost during the operation. A pad of moist sterilized gauze was placed underneath the entire surface of the flaps to prevent oozing while the wound was being sutured, when this was almost completed the gauze was withdrawn and pressure was made over the flaps by means of pads for the same purpose.

A rubber drain was inserted through an opening made in the posterior flap and a second one through the lower angle of the wound.

The wound was dressed on the fourth day, when the drains were withdrawn, and again on the seventh day, when the stitches were removed. It had healed primarily throughout except at two points half an inch in diameter which had become necrotic, probably from pressure. The patient was in an almost perfectly normal condition

throughout the recovery. He insisted upon being up and dressed after the fifth day. He was kept at the hospital for four weeks after his operation for fear of having some injury occur to him, especially on account of his convivial habits. He is still (September 1, 1895) free from a recurrence and is in better health generally than for years before his operation, probably because he has abandoned strong drink and has secured lighter labor, being now a watchman at a railroad crossing.

In a considerable number of amputations near the shoulder or hip I have noticed that the patient is comparatively little shocked when the large nerves are severed with a sharp knife or catlin, but very severely when they are cut with scissors. Consequently, I have been careful in this instance to use the former instrument, and, it seems to me, with benefit to my patient.

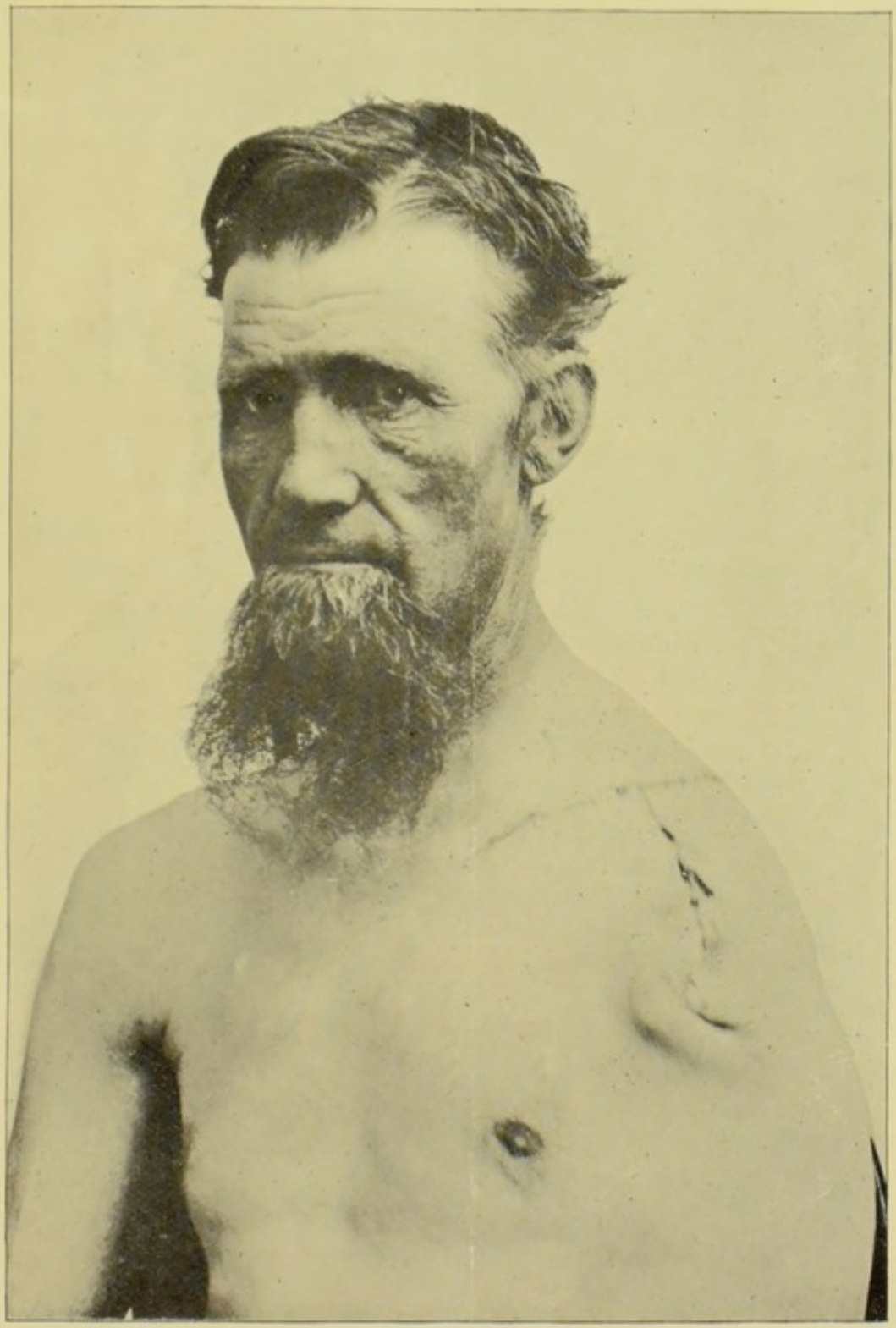
In my former case I ligated with silk, and was annoyed several months later by having the ligature come to the surface, consequently, I used catgut in this instance, and, in order to be doubly sure, applied a second ligature of silkworm gut, which was left long so as to be withdrawn in case the end of the vessel became necrotic beyond the ligature, a condition mentioned by several operators. This condition did not occur in this instance, hence the ligature was simply cut short after the wound had completely healed.

Outside of the danger from septic infection, which can, of course, be practically eliminated in all well-regulated hospitals, the danger in this operation comes from hæmorrhage or shock.

Following the clear-cut directions laid down by Paul Berger, and described above, hæmorrhage can be controlled with comparative ease if the operator is not too meddlesome.

Making the section of the clavicle after reflecting the periosteum, one is not at all likely to injure the underlying vessels.

The brachial plexus can be separated from the blood-vessels with safety. Having done this, it is much wiser to apply the first ligature around both artery and vein and enough of the surrounding tissue to be entirely out of danger of wounding the vein than to attempt to ligate the vessels separately. It is not difficult to separate the vessels from the underlying tissues by blunt dissec-



Ochsner's case of removal of upper extremity together with the scapula and clavicle.

tion, permitting the passage of the ligature with blunt forceps or with an aneurism-needle.

Later each vessel can easily be ligated separately.

This plan helps to avoid two dangers,—viz., injury to the vein, which may give rise to either hæmorrhage or air-embolism, and shock caused by an unnecessarily prolonged operation.

All operators, with whose views I am familiar from their writings, agree that the operation is indicated in all cases in which sarcoma involves the soft tissues of the shoulder-joint or the clavicle or scapula or humerus near the shoulder.

With the great tendency to recurrence after amputation for sarcoma of any portion of the humerus, it would seem best to perform this very radical operation even in cases suffering from sarcoma of the lower part of this bone.

The following report regarding the gross and microscopic appearance of the growths was submitted by Dr. E. R. LeCount, pathologist at Rush Medical College.

"*Macroscopic.*—There are two masses of tumor growth:

(*a*) The larger measures 6.5 x 5. x 4 centimetres, is situated below the clavicle, internal to the head of the humerus. It replaces the upper portion of the subscapularis muscle and that portion of the serratus magnus which is attached to the scapula. It is attached by a small band of tumor tissue to the outer end of the clavicle, which is eroded to a distance of 1.5 centimetres from its outer articular end. Attached to the outer end of the clavicle and continuous with the main mass by a small band of tumor tissue is a fine, uniformly pinkish-red, vascular, slightly nodular growth, about two centimetres in its longest diameter.

(*b*) The smaller mass, about two-thirds the size of the larger, lies directly upon the outer third of the clavicle, replaces the supraspinatus muscle, and is attached to the outer portion of the superior surface of the spine of the scapula.

These two growths are not connected by distinct tumor tissue. They are not well encapsulated, nodular externally, firm, uniform in color, cutting with a grating sensation, and presenting on section areas which are not unlike cancellated bone. The largest of these areas measures two centimetres in diameter. The remaining surface is cartilaginous in appearance.

Microscopical.—Sections were examined from portions of the tumor which presented the most varying appearances to the naked eye, bony areas excepted, hardened in alcohol, embedded in celloidin, stained in hæmatoxylin and eosin.

In all sections cartilage cells were found. In certain areas matrix tissue, homogeneous, granular, staining poorly, was much in excess of cellular elements, and this was the prevalent structure. Other areas showed cartilage cells in excess of matrix substance, these at times showing a slight tendency towards an arrangement in rows. Cartilage cells with indistinct nuclear figures, occurring as many as four in a single capsule, were not uncommon. Areas of hæmorrhage were found, as well as areas of pronounced leucocytic invasion.

Around blood-vessels cartilage cells were much in excess of the matrix substance.

In sections from the small growth attached to the outer end of the clavicle were many small round cells with a single relatively large-sized nucleus, as well as polynuclear leucocytes."

This subject has been discussed very fully, especially during the past eight years, in a large number of papers, and in an exhaustive treatise by Paul Berger. Besides the latter work, the papers by Professor G. Adelmann and T. F. Chavasse seem to me of the greatest value. These authors have tabulated the literature on this subject up to 1888, hence I will enumerate only those articles which are of a later date so far as I have been able to collect them.

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