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EXSECTION OF THE ULNA.

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M. Velpeau in his *New Elements of Surgery*, by Geo. C. Blackman, M. D., Cincinnati, says, "when the body of the bones of the forearm is carious, or necrosed, or degenerated, it may seem impossible to cure the disease without amputation. I have to reproach myself with having amputated the arm of a man whose forearm swollen and perforated with fistulous passages for many years, had nevertheless for its fundamental lesion, no other than fragments of necrosed bone, which were completely isolated in the center of the ulna, and which it might have been possible to have removed by exsection. The same thing happened to me with a scirrhus affection, which was situated in the body of the radius, and which at the present day probably I would have destroyed, while preserving the patient his hand. He also makes the following statements as regards the removal of the ulna.

Scultetus in order to remove an invaginated necrosis of the ulna, made an incision from the carpus to the elbow, and Pezoldi relates that Fr. C. D'Armbruste had successfully extracted twenty portions of this bone from a student affected with spinal ventosa * * * * ; and M. Baudens (*Gaz. Med.*, 1838, p. 415), in a gunshot wound, has removed four inches of this bone. It appears also that the middle portion of the ulna had already been exsected during the last century by a surgeon who was an acquaintance of Orred (*Bull. des Sc. Med. de Bologne; Journ. des Connaiss. Med.*, 1834, t. 11, p. 201). A soldier who had lost a considerable portion of the ulna, and whose case was mentioned by Dupuytren to M. Champon (*These* No. 11, Paris, 1815, p. 57), was not maimed by it; and the exsection of this bone appears also to have been performed by M. Withusen (*Jæger, op. cit.*, p. 20), and by M. Werr (communicated by M. Sprengler, in 1838)."



These are the only cases of partial or entire exsections of the ulna or radius mentioned by this distinguished surgeon in his great work above named.

Prof. S. D. Gross of Philadelphia, in his *System of Surgery, etc.*, mentions the following cases of exsection of bones of the forearm: "A case of excision of both radius and ulna occurred in 1853, in the practice of Dr. Compton of New Orleans. The operation was performed on account of a compound comminuted fracture, two months after the accident, both pieces being removed with the exception of the inferior extremity of the radius. The greater portion of the periosteum which had been detached during the progress of the inflammation, was left in the wound. The patient, a boy, aged fifteen years, made an excellent recovery, having a very good use of the hand. The forearm was three inches shorter than natural, and flexed at a right angle with the humerus.

"Dr. Robert B. Butt, of Virginia, exsected in 1825, the lower two-thirds of the ulna of the left side, in a man twenty-five years old, who several years previously, had received a punctured wound in the wrist joint, causing violent inflammation of the whole limb, as far as the elbow, and ultimately terminating in hypertrophy and caries of the ulna, with immense thickening of the periosteum. Three months after the operation, the man had so far recovered as to be able to pursue his occupation of a housejoiner, flexion, extension, and rotation of the joints being as free and uninterrupted as they had ever been. In 1853, Dr Carnochan performed a similar operation, taking out the entire ulna, which as in the case of Dr. Butt, was excessively enlarged from one extremity to the other, measuring at the base of the coronoid process, five inches and a half in circumference, and weighing nearly eight ounces. His patient, a man thirty years of age, was of a strumous habit, and the disease was supposed to have been occasioned by a sprain of the arm in splitting wood with a heavy ax. No untoward symptoms occurred during the after treatment; very little deformity was perceptible when the wound was healed; and the functions of the hand and forearm were preserved in a remarkable degree. Mr. Jones of Jersey, has also removed the whole ulna. The entire *radius* was exsected by Dr. Carnochan in 1854, on account of caries and hypertrophy, and eburnation caused by a severe blow upon the upper part of the forearm, the patient, a man aged twenty, recovering with such an excellent use of the limb as to be able to write with ease and rapidity. When last

seen, six years after the operation, the parts remained perfectly sound, but the hand was not quite in its natural axis, as it inclined a little outward, while the styloid process of the ulna formed an abnormal prominence on the inside of the wrist. The bone was excised from joint to joint. An operation of a similar kind with an equally fortunate result, was performed in 1859, by Prof. Choppin, of New Orleans, upon a boy, aged fourteen years. In this case, however, the inferior articular extremity of the bone was retained as it was found free from disease.

During the session of 1857, I excised at the clinic of the Jefferson Medical College, somewhat more than the upper half of the bone along with the outer condyle of the humerus, for serofulous disease of several years standing, the patient being a young Irishman in dilapidated health. He recovered well from the operation, but of the ultimate result I am unable to give any account, as the case was soon after lost sight of. The appearance of the limb prior to the operation, is exhibited on page 100.

"Mr. Erichsen states that he has resected the whole radius, with the exception of its articular head, which was sound, and that a useful arm was left. Excision of the lower four-fifths of this bone, was performed by Prof. Carnochan in 1857."

The following is the case of Dr. George Williamson, from his notes on the wounded from the mutiny in India, London edition of 1859.

"Staff Armourer Sergeant, H. W., aged 26, two years and a half in the service, of which five months were in China. He is of healthy appearance. Was admitted into the general hospital, Hong Kong, in August, 1857, immediately after his arrival from England, with symptoms of acute hepatitis and pleuritis. Active depletion was had recourse to, and calomel and opium administered, which produced salivation, and the disease was arrested. On the 3d of September a large phlegmonoid tumor was found near the elbow joint, which was opened, and a large quantity of matter evacuated. From that time the ulna became permanently enlarged, extensive necrosis took place, and a few spiculæ of bone came away. He was admitted into Fort Pitt Hospital, on the 1st of August, 1858, with numerous sinuses along the inner side of the left ulna, extending down to the diseased bone, and the probe also entered from behind into the elbow joint. The radius did not appear to be engaged in the disease. The patient's general health was good.

August 30. The whole of the ulna, as well as an inch and a half of the extremity of the humerus, and also the head and neck of the radius, were removed by a single incision along the posterior and inner side of the forearm, by Staff Surgeon Dr. Williamson. The skin was dissected back, and the ulner nerve cleared away from the internal condyle. The disease was found to extend the entire length of the ulna. An endeavor was at first made to disarticulate at the wrist by cutting the lower attachments of the ulna; but it was found to be much more easily accomplished by cutting the triceps and lateral ligaments, and getting into the elbow joint. The entire ulna was now disarticulated and dissected out. An inch and a half of the ends of the humerus and radius were then removed. No vessels required to be tied. The wound was left open for three hours, when sutures were inserted, and the arm placed upon a straight splint.

September 1. The arm was placed in a semi-bent position, and laid upon a gutta percha splint.

September 5. The whole of the wound had healed by the first intention, and the sutures were removed.

September 8. The splint was taken away, and he could move his fingers and hand, and get his left hand to his mouth with the assistance of the right, but could not do so of his own accord.

September 10. The wound completely healed twelve days after the operation.

September 12. He continues to move the joint and use his fingers; but is only just able at present to raise the forearm, showing that he is beginning to regain the power over the biceps muscle. The arm is, however, small and weak. There is every prospect of the patient having a very useful arm and hand. His general health is good, and he is out of bed and going about.

On examination of the parts removed, it was found that the whole of the ulna was much enlarged, from the deposition of new osseous matter, enclosing several portions of necrosed bone. The whole of the cartilages covering the ends of the bones forming the elbow joint were absorbed, and the bones carious.

It is not often that a case occurs where the disease is entirely confined to the ulna and bones of the elbow joint. With regard to the operation, it was found much more easy to disarticulate from the elbow than from the lower extremity of the ulna, and care was required to avoid cutting the arteries and nerves by keeping close to the bone. It is also worthy of remark that no

vessels required to be tied, although they must have been increased in size to supply the enlarged ulna. The rapidity with which the wound healed is also remarkable."

About the 29th day of January, 1869, Mr. R., an American, æt. 42, of strumous habit, called at my office for advice concerning his right forearm which was a little swollen and very painful. He supposed himself to be suffering from the effects of acute rheumatism, as the pain was near the elbow joint, and his general health impaired. This was on Wednesday, and he had continued to work at his business, carpentering, until the Thursday previous. From this time forward the swelling and pain of the fore-arm continued to increase, and although but very little redness was present, it was evident there was fluctuation near the elbow joint, and upon his being advised to have an incision made for its evacuation, declined doing so until Sunday, the 30th inst. The fluid was deep seated, and the bistoury penetrated at least an inch and a half before it was reached. This gave vent to a large quantity of unhealthy-looking pus, and was attended with great relief of the pain.

Previous to this, however, he told me that about a week before calling upon me, he had lifted a heavy piece of scantling, and that in doing so, he felt a severe pain, more like an electric shock than anything else he could compare it to, strike through his arm; but, notwithstanding, continued his usual employment, although there was considerable pain in the arm from the time of injury.

For some days after opening the abscess he applied a large poultice to the arm, but the suppuration and swelling increased, at the same time extending toward the hand. I explored the wound with a probe, and found there was diseased bone (caries of the ulna). The disease, however, continued until the forearm was enormously swollen, and another abscess formed above the carpus; this also was opened, and revealed a carious condition of the ulna, as far as the probe could extend. His health becoming very much impaired from irritative fever, I recommended him to submit to exsection of the ulna, as the only means of relief short of amputating the arm, as the exploration with the probe denoted disease of the bone as far as it could reach from either opening that had been made for the evacuation of matter.

At this time my friend Prof. George C. Blackman kindly visited Mr. R. with me, and strongly urged an operation for the removal of the entire ulna. The patient, however, hoping against hope,

deferred the operation until he felt convinced his life was threatened, his health and strength persistently giving way, until severe cough and night sweats had set in from the immense drain and irritation to his system, from the purulent discharge and severe pain, notwithstanding he had been under sustaining treatment for some weeks. Feeling, however, that an operation was the only remedy that promised any permanent relief, he decided to submit to having the bone exsected.



On the afternoon of the 25th day of February, I performed the operation at Prof. Blackman's clinic, at the Good Samaritan Hospital before the class of the Ohio Medical College, and many other medical gentlemen of this city. There was also present Surgeon Perrin of the U. S. army, and Dr. Wiest, of Richmond, Indiana. After administering chloroform, assisted by Dr. N. Foster and Prof. Conner, the former holding the brachial artery, and the latter having a blunt hook ready to hold the ulnar nerve out of the way, if necessary, I commenced my incision an inch above the olecranon process, and after dividing the triceps tendon and the lateral ligiment, carried the incision down the inner side of the

ulna, carefully dissecting off the muscles from the bone, leaving as much of the periosteum as possible, sometimes pressing it off with the fingers where it was loosened by ulceration, or using the handle of the scalpel whenever I could, until the incision extended an inch below the styloid process. I took the precaution to keep the knife constantly close to the bone when it was necessary to cut in order to avoid the vessels and nerves. The operation required but a few minutes to complete, and after waiting long enough to ascertain whether it would be necessary to ligate any bleeding vessel, closed the wound with sutures. No vessel required to be tied. Before closing the wound it was well washed out with a solution of carbolic acid. The arm after being dressed was laid upon a pillow, and the patient taken home in a wagon in the recumbent position, being very much prostrated in his already weak condition, by the shock of the operation and the effects of the chloroform. The other bones of the arm did not appear to be diseased, although the internal condyle of the humerus was dry and shining.

Profuse suppuration continued for some weeks after the operation, and for a few days the cough and night sweats increased; at the end of this time, however, his health began to improve. At the end of two months the wound had entirely healed, with the exception of a sinus underneath the elbow joint. After this healed, an abscess formed above the wrist not far from the articulation of the radius with the carpus; it was opened and after discharging for sometime, healed. His confinement to the bed lasted three weeks. From this forward his health continued to improve, but abscesses would frequently form near the wrist and elbow during the spring and most of the summer.

July 1, 1870. I saw Mr. R. a few days ago, and find the usefulness of his arm to be very good and improving. The accompanying engraving, taken last February, just one year after the operation, is a correct representation of the condition of the arm at that time, and the representation of the bone which is held in the hand, is the one exsected from the arm, showing a very carious condition, looking almost as if it had been worm-eaten.

While there has not been perhaps as good a result in this case as some of those mentioned in the report, yet, I am convinced that in most of those cases of injury or disease of the bones of the forearm, whether involving the joints or not, it is much better to follow the conservative plan of procedure as in this case, than

to resort to the more formidable one of amputation, and afterward feel the same self-reproach as that expressed by the great Velpeau.

With the exception of ankylosis of the elbow joint, the arm is nearly as useful as it was previous to the injury which led to the exsection of the ulna, this result being caused by subsequent inflammation of the other bones of the joint and not the operation. There is, I think, some reproduction of the ulna, commencing at the elbow joint and extending about three inches toward the hand. This latter circumstance may also have something to do with the ankylosis present.

Recd. Aug 29th
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