A COMMUNICATION
ON THE
REMOVAL OF A GROWTH FROM THE
BRACHIAL PLEXUS,
AFFECTING THE ROOTS OF THE EIGHTH CERVICAL AND
FIRST DORSAL NERVES AT THEIR EMERGENCE
FROM THE INTERVERTEBRAL FORAMINA.

BY
EDWARD BELLAMY, F.R.C.S.

Received September 9th, 1885—Read January 12th, 1886.

TUMOURS associated with the large nerve-trunks of the cervical and brachial plexuses are comparatively rare, and a successful removal, with complete restoration of functions, possibly still more so.

The following case has therefore been considered worthy of record—not only surgically, but as having several points of physiological interest.

On Nov. 11th, 1884, I saw, in consultation with my colleague, Dr. Mitchell Bruce, a lady, fifty-four years of age, of considerable embonpoint, who suffered from a growth in the root of the neck.

The swelling occupied the right side of the neck, and

sprang from the base of the subclavian triangle, and was evidently very deeply seated. It was of doubtful mobility, and caused the patient very great pain when manipulated, however gently. I learned that, for several years past, the patient had complained of tingling and pain shooting down the arm and rendering it useless, whilst her health was becoming seriously affected.

About two years ago she noticed the present growth, appearing just above the centre of the right clavicle, and becoming especially evident when the shoulder was depressed. It steadily but very slowly increased in size. All the muscles supplied by the ulnar nerve appeared to be affected, both in the forearm and hand, whilst the areas supplied by the cutaneous branches of this nerve, and indeed of the entire inner cord of the brachial plexus, were excessively sensitive.

There was, moreover, extreme sensibility on the lateral aspect of the thorax ; apparently corresponding with the intercosto-humeral nerve.

The integument supplied by the cutaneous branches was cedematous and shiny, and the veins somewhat congested.

The exact diagnosis of the nature of the case was manifestly difficult,—whether there was a tumour of, or in some portion of, the brachial plexus ; whether the symptoms were the result of pressure from a growth dissociated with the nerves ; or whether the swelling was possibly due to a consolidated aneurismal sac. The symptoms, however, pointed to a growth involving the root of the ulnar nerve.

It was deemed advisable to discover the real nature of the growth, and if possible to remove it.

Operation.—On November 17th, assisted by Mr. Stanley Boyd, after drawing down the integuments, I made a linear incision along the clavicle, as in ligature of the subclavian, but finding I had no room, I converted this into a $\perp$ incision, the vertical portion of which ran up along the posterior border of the sterno-mastoid. Some few superficial veins were cut and tied. Arrived at the

omohyoid, I hooked it up out of the way, and proceeded to define the growth with my fingers. Some portions of the plexus came into view, clearly placed over it, and apparently somewhat "frayed" out. On these nerves being hooked aside an encapsuled growth, smooth on the surface, in shape like a chestnut, and having one pole adherent to the scalene muscles was exposed. This pedicle was cut through with scissors, when a small nerve was divided. The under surface of the growth partly rested on the first rib and pleura, and partly encroached upon the combined cords of the last cervical and first dorsal nerves, at their emergence from between the scalene.

The growth was then readily peeled off a nerve of no great size, perhaps the suprascapular, perhaps the anterior thoracic, but certainly not one of the great cords, whilst the subclavian artery lay at its base inside. This vessel was carefully hooked on one side. The chief attachment of the growth was towards the scalene muscles. Owing to the fatness of the neck the tumour was very deep, but the entire operation occupied but a very short time. A drainage-tube was put in, the edges of the wound approximated, a pad of salicylic wool placed over all, and the arm brought across the chest. (The wound was completely healed on the seventh day and the temperature never rose above 99° F.). On the day after the operation the patient stated that, although in some pain, it was of a very different character to that she had experienced before the operation was performed.

Progress of the Case.—Shortly after the operation some symptoms of paralysis of the muscles of the arm and shoulder came on. The patient could not grasp with the fingers nor rotate the elbow-joint, and she was unable to lift the arm from the side. As this condition became more marked, it was decided to apply the constant current, and this was obtained by the ordinary Leclanché battery, thirty cells' strength. Galvanism was at first productive of little or no good. But under the care of Dr. Risk, of Harrow, by great attention to the application of the current, the

functions of the arm began slowly to return. At the present date (July, 1885) the patient has complete control over the arm, forearm, and hand, perfect sensibility, and complete freedom from pain.

Nature of the Growth.—The following is the account of the examination of the tumour by my colleague, Mr. Stanley Boyd :

“ The tumour has the shape of a flattened sphere, one inch in its longest diameter, well encapsuled, smooth on the surface, having one pole adherent to the scalene muscles, and it was at this point on cutting through its pedicle with scissors, that a nerve seemed to be divided. A few nerve-fibres were found spread out on the superior aspect of the growth, but none penetrated the capsule, and there was no trace of nerve-structure in it on section.

“ The section had a greyish or yellowish, more or less translucent appearance, the soft tissue being intersected by distinct bands of fibrous tissue, stronger and better marked inferiorly than elsewhere ; superiorly almost all the tissue was soft and translucent. A scraping examined in water showed the tumour to consist largely of round cells, about as large on the average as white corpuscles. The nucleus was rarely seen, and most of the cells contained a few fat cells ; granular oval cells were common, perhaps representing spindle-cells with processes torn off. Small shreds consisted chiefly of closely-packed cells, arranged in groups separated by bands of fibrous tissue or of spindle-cells.

“ A section stained and examined under the microscope shows the growth to consist of closely-packed cells of the above form, the spindle-cells forming broad bands between groups of round or of spindle-cells cut transversely. For the most part the substance between the nuclei is in small amount and obscurely fibrillated, thus producing the whitish bands visible to the naked eye. In this denser tissue small irregular spaces, formed probably by mucous degeneration and containing clear coagula, are sometimes seen. The vessels are tolerably numerous, and of con-

siderable size ; their walls are formed by the tissue of the growth. No nerve-fibres were detected.

"The tumour is therefore of the common connective-tissue type, showing but a slight departure from the embryonic condition. Had it infiltrated surrounding tissues it would unhesitatingly be classed as a sarcoma, but if this is its anatomical position the presence of a capsule and the ease with which the growth shelled out, afford ground for believing that it will not recur."

Since the above was written I have received the following note from the patient's medical attendant in the country :

"On Feb. 20th, this year (1885), she had an attack of hemiplegia (right) owing to an embolic plugging of her left cerebral artery.

"The result of this was a return to nearly a similar condition of the arm as when she first came under my care. By the end of July, however, with the aid of occasional applications of the electric current, &c., she was able to sew, cut up her food, and write with a pen very fairly well, besides having considerable muscular power. From that date brain-irritation began to show itself, and finally culminated in an attack of acute mania. She died about the end of October from the effects of another grave brain-lesion, I believe in all probability profuse hæmorrhage into the medulla oblongata.

"But for these important complications I believe the case would have been ultimately successful."

NOTE BY J. MITCHELL BRUCE, M.A., M.D., F.R.C.P.LOND.

The leading feature of this case was *pain*, either of the nature of "a sort of soreness," increased by movement, so that the forearm had to be supported by the other hand, or of "a sudden, jerking, neuralgic" character, confined to the ulnar area of the hand. This pain was

accompanied by violent aching of the whole hand and forearm when muscular movements were attempted. There was also some itching of the ulnar border of the hand. No muscles were ascertained to be affected beyond those supplied by the ulnar nerve; but both the degree and the progress of the paralysis were difficult or impossible to determine exactly, on account of the severe pain which prevented or limited voluntary movements. No affection of the pupil was ever observed.

There can be no reasonable doubt but that the patient's death was entirely unconnected with the tumour or with the operation, and that it was due either to embolism or to cerebral hæmorrhage. The patient had been for an indefinite period the subject of aortic obstruction, and the cardiac action was irregular during the whole of the time she was under our observation. She had several attacks of incomplete paralysis, with disturbances of consciousness, before the fatal seizure; in one of them there was marked aphasia. (*May*, 1886.)

(For report of the discussion on this paper, see 'Proceedings of the Royal Medical and Chirurgical Society,' New Series, vol. ii, p. 41.)