alimentation, by judicious mouth feeding as soon as the anæsthetic sickness has ceased, and by the use of small doses of strychnine administered subcutaneously, when called for by nervous depression or heart failure. A rigid all-round asepsis, the employment of gauze drainage where necessary, and the careful removal of the infected bile as it flows from the ducts, give one security from sepsis.

I have purposely said nothing of the operative technique of choledochotomy, as the subject is already a sufficiently large one for discussion; and I thought more profit would result from a limitation of my paper to the question of surgical treatment of obstructive jaundice as a whole.

CASE OF EXCISION OF CLAVICLE FOR A ROUND-CELLED SARCOMA.

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DURING the past two years I have had under my care a considerable number of primary tumours of bone, the majority of which have been malignant and of the type known as sarcomata. Of the bones involved some were those usually attacked, such as the humerus, femur, and tibia, while there were others, such as the ulna, scapula, and clavicle, that are less commonly the seat of these new growths.

Injury in a certain number of the cases was associated with the appearance of the tumour, but in others no such cause could be traced. As bearing on this point one of my cases was of special interest. It was that of a sarcoma of the femur occurring in a male aged 65, who had suffered from an ununited fracture of that bone twenty-six years previously. The fracture had been successfully wired by Lord Lister in the Edinburgh Royal Infirmary about twenty-five years ago. Looking to the very general view that sarcomata hold a double relation to fracture—namely, that they both cause it and also result from it—I was prepared to find that the new growth had originated in the line of fracture. Examination, however, of the specimen after amputation showed that this was not the case. The tumour was situated in the lower fragment of the old ununited fracture, the line of union of which was distinct and easily made out, and was perfectly firm.

The case to which I wish specially to draw attention in the present paper is one of sarcoma of the clavicle. Apart from the fact that this bone is very rarely attacked by such growths, there are other points about the case that justify its being put on record.

History.—The patient, A. M., was a girl, aged 16, who was sent by the late Dr. Black of Greenock to be under my care at the Glasgow Cancer Hospital. She was admitted there on September 30th, 1899. Of a fair complexion, her general appearance was that of good health, although perhaps somewhat anæmic. She complained of a swelling of about seven months duration in the left side of the neck, which was accompanied by some pain on the surface of it. She could assign no cause for the appearance of the swelling, and it came, she said, at first, as a small movable lump near the collar bone. It had given rise to very few symptoms. At one time she had pain passing down the arm and up the side of the head, but that had now disappeared. It was more the size of the growth and its rate of increase that were causing concern to her relatives.

State on Examination.—Examination of the left side of the neck showed that there was good ground for these anxieties, for in the situation of the left clavicle there was a large globular tumour the size of an infant's head (see Fig. 1), covered by normal skin, in which large vessels were seen ramifying. The swelling commenced at a point $\frac{1}{2}$ inch from the outer end of the left clavicle, crossed the middle line, and reached close up to the sternal end of the right clavicle. Above it rose to the level of the prominence of the thyroid cartilages, and below it descended over the second rib. On palpation the mass had a firm elastic consistence, and almost gave the impression of being a tense cyst. No fluctuation was present, and no pulsation could be made out in it. It was firmly anchored down at its base, apparently to the clavicle, but it was not easy to say whether it passed deeper or not. There was certainly no evidence of pressure upon any important structures. A skiagraph of the parts showed that, with the exception of a small portion at its outer end, the left clavicle had almost disappeared, but beyond this nothing very definite could be made out. The thoracic organs were healthy, and no secondary deposits could be detected elsewhere. The urine, too, contained nothing abnormal.

The two points that had to be decided about the case were, first, the nature of the tumour; and, secondly, the advisability of its removal. As regards the former, the clinical history and the appearances presented by the skiagraph pointed to its being a sarcoma that, whatever its seat of

origin at first, had now involved the clavicle, and was likely to go on increasing. Upon the question of removal, there was something to be said for and against it. Everything, of course, depended on the deeper attachments and relations of the tumour, especially as regards the pleura and the large vessels behind. The absence of all indications of their involvement, the as yet local character of the growth, the good general health and youth of the girl, were points distinctly in favour of removal, and decided me to recommend the patient's friends to submit her to the risk of operation. Accordingly I wrote to Dr. Black to that effect, who concurred.

Operation.—The operation was done on October 16th, the anæsthetic used being chloroform. The incisions used are seen in Fig. 2, and were of the H-shape. The chief one was across the upper surface of the tumour in its long axis and in the line of the clavicle. At the inner end of this was another one nearly at right angles to it, but curving downwards and crossing the left sterno-clavicular articulation. A somewhat similar incision was made at the outer end of the first, exposing the pectoralis major, where it formed the anterior axillary fold. Flaps of skin, very thin, were then dissected up exposing a very vascular tumour. Its

Fig. 1.

upper border was first attacked and freed as far as possible. Then the outer end was cleared, and the clavicle sawn across in its outer quarter clear of the growth. The tumour, along with the inner portion of clavicle, which was incorporated in it, was next turned inwards and dissected off its deeper attachments. This was a matter of some difficulty, especially where the growth came into relation with the subclavian and internal jugular veins, nor was it easy to get away all the remains of the clavicle at its sternal articulation owing to its fragmentary nature. It was, however, accomplished. After gouging out a portion of the sternal end of the second rib, which was somewhat eroded, and after the removal of some enlarged glands in the posterior triangle of the neck, the edges of the incisions were brought together with sutures of horsehair, and three iodoform wool drains were inserted in different places. The patient bore the operation very well, and did not suffer much from shock.

Description of Tumour.—Reserving in the meanwhile the detailed microscopic account of the tumour, it may be mentioned here that on removal it formed a globular mass, flattened somewhat antero-posteriorly. It measured $5\frac{1}{2}$ inches in its long diameter, and about 3 inches in depth, and it was covered by a fairly well-marked capsule, to which portions of muscle and fascia were adherent, while at one part of it was the sawn surface of the outer end of the clavicle. On section the surface presented uniformly a "fleshy" appearance, with here and there trabeculae of

fibrous tissue. A portion of it examined under the microscope showed it to be sarcomatous, and to be of the small round-celled variety.

Progress.—The after-progress of the case was uneventful. The patient made an excellent recovery, and went home on November 25th with the wound soundly healed. Fig. 2 was taken before she left the hospital. She continued to enjoy very good health, but six months after the operation she was again sent to see me by Dr. Black, because of some pain and fulness in the neighbourhood of the scar. Examination of the part showed great hyperæsthesia of the skin, but beyond an indefinite hardness (possibly cicatricial) under the border of the trapezius no tumour could be felt. I thought it prudent, however, to examine the part more thoroughly.

Second Operation.—On May 18th of last year, the patient being under chloroform, I raised a flap of skin and exposed the edge of the trapezius muscle. Under it were found some small glands. These, along with some surrounding fat, were removed. Microscopic examination of them showed that they contained a dense accumulation of small cells, in some respects resembling the cells of a small round-celled sarcoma. At the same time the general appearance of the cells, and the absence of general infiltration of the glands, were more suggestive of an inflammatory process, and the continued good health of the patient, and the satisfactory local condition of the wound, are confirmatory of this view.

The good range of movement that exists in the left arm was

Fig. 2.

noted before she left the hospital on the first occasion, that is, within two months of the operation. Although the tip of the affected shoulder had fallen downwards, inwards and forwards, and was three-quarters of an inch nearer the middle line than the other shoulder, the patient could by a jerking and throwing-up motion touch the top of the head. She could also extend the hand anteriorly to the same extent as on the sound side, and she could also pass it behind her back with ease, but with the arm extended from the side she could not raise the hand above the level of the shoulder. On patient's second return to hospital there was, however, a still further improvement in all the movements; and, indeed, they seemed nearly as perfect as those of the sound arm. This state of matters is, I find, in keeping with what has been observed in the cases of removal of the clavicle recorded by Mott, Travers, and Jessett.

Microscopic Examination of Tumour.

The chief point of interest, however, in my case lies in the microscopic sections of the tumour, and I should like here to acknowledge my indebtedness to Dr. Ernest Fortune, Assistant Surgeon to the hospital, for his careful and skilful preparation of these and of the photomicrographs illustrating this paper. The sections reveal masses of small round cells,

Fig. 3.—Low power.

with a well-marked connective tissue stroma. In addition there is present the very striking and peculiar feature that in each group of cells, and generally in the centre of it, there are present one or more well-marked blood vessels around which the cells are arranged in a concentric manner (Fig. 3, low power). This arrangement of the cells, and the very

Fig. 4. High power.

constant relationship of the vessels to them suggest that they have arisen from some portion of the vessel wall, probably the tunica adventitia or its vessels. If so, then the tumour should be classed under the "angio-sarcomata," a group first described by Kolaczek and so named by him. Histologically, their characteristic is that they are made up

of round-celled masses surrounding blood vessels. We know that a very general feature of all sarcomata is that their cell proliferation is very active in the immediate vicinity of the blood vessels in them, and some pathologists go the length of asserting that all forms of sarcomata originate in the blood vessels. This is probably too sweeping an assertion, and is not supported by facts; but there is undoubtedly a variety of sarcoma characterised by masses of round cells, which are grouped round blood vessels and spring from their adventitia or outer coat. The present tumour in every way corresponds to this description, and the origin of the cells is manifestly from the adventitia, for the sections show that the endothelium of the vessels is in the present case quite unaffected (Fig. 4, high power). This fact distinguishes it clearly from the group of endotheliomatous sarcomata, which have their starting point in the cells of the endothelium. Seeing that in the angio-sarcomata the cells are arranged in the form of groups around the blood vessels, which thus occupy the centre of the cell masses, it is easy to see that the section of such a tumour would present an alveolar structure, and to some extent that appearance is present in this case (see Fig. 3). The angio-sarcomata are occasionally pigmented, and are often the seat of degenerations, such as the hyaline, and, when this latter attacks the coats of the vessels in such tumours, we get the cylindroma of Billroth, the feature of which is the occurrence of a number of clear spaces in the sections. No such changes were anywhere observed in the present case, nor were any blood cysts or hæmorrhages present in the tumour, notwithstanding all its vascularity. This fact may be due to the very complete development of the vessels, all of which present well-defined walls, and are quite unlike the thin-walled spaces that serve as blood vessels in the majority of sarcomata.

Whatever structure, then, may have been the starting point of this tumour, it seems to have had its beginning in a cell or cells of the walls of a blood vessel, and to have developed a type of structure that, from its vascularity, has been deemed worthy of a special designation—namely, angio-sarcomatous.

The after-history of the case will be of interest, for while there seems a very general opinion that metastasis in the angio-sarcomata is uncommon, unless when pigmented, there is not the same unanimity as regards local recurrence. Senn states distinctly that it is very rapid after excision, while Stengel goes the length of saying that it is uncommon, and that angio-sarcomata are in a measure benign. So far the present case supports this latter view, for two years have elapsed since the operation, and, I know that the patient has remained well, and that there have been no signs either of local recurrence or of metastasis. I confess that the very vascular appearance that the tumour presented at the time of its removal made me apprehensive of an early reappearance of the growth either locally or elsewhere.

ON BLINDING OF THE RETINA FROM EXPOSURE OF THE EYES WHEN WATCHING THE ECLIPSE OF THE SUN.*

By SIMEON SNELL, F.R.C.S. EDIN.

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MR. C. J. B., aged 40, came to me on May 29th, 1900, and stated that on the previous day he was watching the eclipse of the sun intently. It may be remembered that the eclipse commenced about 3 o'clock, attained its greatest magnitude about 4, and was over by 5. He was looking first through a blue glass, then a ruby glass, but also for a short time with the naked eye. An hour or two later, when he was doing his work (examining boots, lasts, etc.), he noticed that direct vision was blurred, but outside this it was apparently unaffected. It was most marked on the same evening on attempting to read the newspaper, which he found it was impossible to do. The appearance was a hazy blankness, the shape being round, the outline being indistinct, and the haziness less marked towards the edges where the type of the newspaper was visible. At first he thinks the "blurr" in

*Read before a meeting of the Yorkshire Branch of the British Medical Association.

front of his eyes was about the size of a penny, but it soon became smaller.

On the first day I saw him (May 29th) direct vision = $\frac{1}{4}$, eccentrically, $\frac{1}{8}$. Each eye was similarly affected. There was some slight haziness round the papilla in each eye and the veins were a trifle full. There were no definite alterations at either macula. In fact, the changes visible with the ophthalmoscope were almost *nil*. No definite scotoma was detected and mapped out, but over the area of fixation vision was blurred. The patient asserted if he saw a person approaching him, and was looking at his head, he did not see the head but only the body and legs; in the same way, if he looked at a person's chest he saw the head and legs only. Potassium iodide in a mixture was prescribed and coloured protective glasses were ordered.

The central blurr became fainter and gradually decreased in area, and on June 8th direct vision = $\frac{1}{2}$ each eye. June 22nd: He says that the blurr has disappeared since about the 12th, leaving in its place the disc which is referred to later on. July 5th: Vision = $\frac{1}{2}$ each eye. November 7th: Says he is perfectly well. The patient has written the following account for me:

The total time the eyes were exposed to the sun would be about one hour, in periods of from two to ten minutes. That the glasses did not provide a sufficient protection for the eyes is proved, I think, by the fact that when they were first directed to the sun (every time the sun was looked at) nothing but a glare was visible. By steadily watching the sun the glare vanished in a few seconds, and the eclipse was plainly seen. No further inconvenience would then be noticed during that observation. The vision was found to be defective immediately after the first observation, but no notice was taken of it, as it was thought to be merely temporary, like going out of the dark into a brightly-lighted room. When the eyes were closed I saw a bluish disc about the size of the apparent disc of the sun; this would fade out after a few seconds, and, I think, come on again without opening my eyes in the meantime. This lasted for twenty-four hours after the eclipse. Not the slightest pain was felt. The effect was well marked when I looked at a straight line, from about the ordinary reading distance; there was a break of about one-eighth of an inch in the line. In reading, also, part of the line was blotted out. Straight lines were in no way distorted. Throughout my life my eyes have been of average strength, and I have never worn spectacles of any kind. During the last quarter of an hour the ruby and blue glasses were put together, as then the sun was very bright. Twice the eyes were turned upwards to the sun without any glass, but only for a second or two.

June 19th, 1901. Mr. B. says, the only thing he notices now is that he thinks his eyes are more affected by glare than formerly. For instance, after looking at the sun or electric light he does not think the eyes recover themselves as quickly as they previously did. He says he could not for some days after the original injury take a reading of the thermometer or barometer. A week after, when reading a Fortin barometer, as the vernier approached the top of the half-inch column of mercury he noticed a grey disc exactly between the top of the mercury and the vernier. He read the barometer at about 10 or 12 inches distance, and he calculates that the size of the spot was 0.026 inch in diameter (about two-thirds of a millimetre). This he observed with each eye, and just the same size. He does not think the size of this disc in any way altered up to six or nine months after the eclipse, merely growing fainter. Practically his eyes are all right now, but a careful search to-day allowed him to discover a very faint trace of this same disc, which would otherwise not have been noticeable. It is unmistakably less. On account of its faintness and tendency to disappear altogether he finds it difficult to measure it accurately. After a number of observations he concludes the spot has now a diameter of 0.014 inch, or about half what it was previously.

June 23rd. No ophthalmic alterations are visible in either eye. For the sake of making the examination complete the right pupil was dilated with a mydriatic.

Several instances have been recorded of injury inflicted by the direct effect of sunlight on the eye. Dr. Mackay, in the *Ophthalmic Review* for 1894,¹ collected probably the whole number which had been published up to that time. I have observed two cases in addition to the one which I record here, in each of which one eye only was affected. One was the case of a youth² aged 17, who was looking at the heavens through a powerful telescope, and in shifting the instrument he received the full blaze of the sun directly in the right eye which he was using. The immediate effect, he said, was as if the sight was "gone," and when I saw him seven weeks later he had still a "black dot" before the eye, which he described as being about the size of a pin's head. V.—1.5D. = $\frac{1}{8}$. As