REMOVAL OF THE ASTRAGALUS IN AN ADULT, IN A CASE OF CONGENITAL TALIPES.*

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HAVING had the honour on a previous occasion, so long ago as the year 1872, when our Association met at Birmingham, to lay before the Surgical Section an account of a very interesting case of congenital talipes, in which I had removed the astragalus from each foot in a boy at that time seven years of age, I have now the opportunity of relating to the meeting a case of a similar nature in an adult.

It is that of a man named Abraham Taylor, a factory operative, aged 29, who from birth had been the subject of talipes equino-varus of the right foot, for which, according to his statement, no attempt had been made at any time to remedy the deformity, but he had been able up to very recently to walk about with that peculiar stumping gait which is observed in such cases. About two years ago, having previously suffered considerably from the formation of corns and tender spots on the external border of the foot, it appeared that these had become so troublesome that at last ulceration of the skin set in, and for nearly twelve months before his admission into the Manchester Royal Infirmary in March 1878, he had been entirely prevented from following his work, owing to the intense pain and inconvenience resulting from the ulceration which nothing seemed to control. The exact condition of the foot and its relative position to the leg will be well seen by this model, taken a few days before the operation which I am about to describe; and it will be observed that it is a cast not only of the foot, but also of the leg and thigh, so as to show the amount of deviation from the natural relative position of the knee- and ankle-joints which frequently exists in confirmed cases of talipes varus, but which certainly is not excessive in this instance; for the patella will be found nearly in the same line as the front border of the tibia, very little of the twisting of the leg upon its axis being here visible.

Having determined to attempt in this instance to improve the form of the foot by removing the astragalus, I proceeded to perform the operation on Saturday, the 30th of March last, assisted by my colleague Mr. Bowring, who helped me in my previous case. I commenced, as I always do in operations conducted on antiseptic principles, by thoroughly washing the part to be operated on with ordinary soap and carbolic acid lotion, so as to purify the surface as completely as possible from any of the excitors of putrefaction; and as there was on the side of the foot a large corn with a recently ulcerated centre, I began by slicing it off with the thickened cuticle, and rubbing the surface so exposed with a strong solution (40 grains to the ounce) of the chloride of zinc. This I did to destroy the germs of putrefaction which would propagate their influence some distance from the spot into the new wound I should make, unless the greatest care were taken to prevent such a result. I did not apply any tourniquet to the leg, nor did I use Esmarch's system of pressure, as was afterwards suggested I might have done, as it occurred to me that the hæmorrhage likely to result would be so slight as to make such a procedure hardly needful. A very careful digital exploration of the markings on the surface of the foot was then made; and here I found a condition of things so far as regards the positive nature of the displacement of bone very different from what I had described in the younger subject on whom I had operated. The most projecting spot of bone on the external side of the back of the foot was not in this case the head of the astragalus with its rounded outline, but a more square projection with central depression and a somewhat sharp edge, suggesting that it might be the trochlear surface of the astragalus in some way slightly changed in shape; and so it was ultimately proved to be, for, from the long contraction of the inverting muscles of the foot acting on that part of it which lies in front of the medio-tarsal joint, the head of the astragalus imperfectly developed had become ankylized to the scaphoid. The astragalus had been dislodged from the inter-malleolar space, and carried transversely across the antero-posterior axis of the foot. And thus my first incision brought into view this part of the astragalus and not the head, which lay buried a little more deeply towards the internal border of the curled-up foot. The subsequent incisions through the skin and through the other tissues were made in the same part and in the same line as in my former case, viz., between the outermost tendon of the extensor longus digitorum and the tendon of the peroneus tertius, rather nearer to the former, which had

to be drawn over by hooks whilst the astragalus was being extracted I then completely divided the tissues on each side of the bone, cutting through the thickened, opaque, and whitish layer of dorsal ligamentous fibres which were found over the astragalus, and which seemed to have become hypertrophied rather than wasted by long-continued tension. With the aid of a slightly curved raspatory, such as is used in operations on the palate, I separated the bone all round from its connections on five of its six sides. But, to detach it from the scaphoid, I had to break away some of the cancellated tissue of the head, where it had joined the scaphoid so firmly that the two bones were blended together. Now, a great difficulty still existed, the firm fixing of the astragalus to the bed in which it was held by the shortness and strength of the inter-osseous ligament between it and the os calcis. Here my curved cutting-hook served me well in dividing these fibres and setting the bone at liberty. I used it rather too vigorously as a lever with which to raise the bone; and in so doing I broke off the extreme point of it, and it was not until after a long search for it that I found it at the bottom of the wound.

With this exception, the operation was really not difficult of performance; and, when the astragalus was firmly grasped by Ferguson's lion-forceps, and held steadily so as to raise the bone, I managed to dislodge it with great facility. This being done, the foot could be placed at right angles with the leg, the upper surface of the os calcis being received into the space between the two malleoli. The foot was so much shortened and crumpled up by old contraction of fascia in the fold on its internal border, and by tension of the tibialis anticus muscle, that I divided these structures subcutaneously with great benefit. Yet, it was evident that, whatever the ultimate result of the operation might be, we should always have to do with a foot diminished in the length of its antero-posterior axis by imperfect growth, as well as by displacement of bone. There was some arterial bleeding at both the subcutaneous punctures, but this was not more than could be restrained by moderate pressure.

Every stage of the operation was conducted on Lister's principles: an India-rubber drain-tube was put in, the edges of the wound were held by carbolised silk sutures and enveloped in cere-cloth dressing, the foot and leg were then fixed on a McIntyre's splint with an adjustable foot-piece; but the abnormal displacement of the foot was for the time not much disturbed.

The progress of the case from the date of the operation has been as favourable as could be expected under the circumstances. There have been none of those complications which doubtless would have occurred if antiseptic precautions had not been taken. There has been no inflammation beyond the immediate neighbourhood of the wound; and, deep as it was at the time, it has gradually filled up, I presume, by organised blood-clot, for at no time has any purulent secretion been observed.

Within about three weeks from the date of the operation, I had removed all the sutures; and in six weeks from the same date, the wound might be pronounced to be healed, except over a square quarter of an inch of area. I then proceeded to draw the foot into an improved position, and to overcome its continued disposition to undergo contraction from this direction. I tried to correct this by pressure by an inside splint, but the circulation in the leg was so feeble that it seemed dangerous to make any long-continued pressure.

I have had constructed for this case, within the last fortnight, a very well-made shoe upon Mr. Adams's principle, with the five-wheel action; and I thought everything was going on favourably until about ten days since, when, by the pressure having been applied on one occasion rather too violently, great tenderness of the whole foot has been set up, as if general diffused inflammation of the tarsal joints was imminent. But, as you will see by the cast which I now show, taken on the 1st of August, there is perceptible improvement in the form and position of the foot, which I can assure you is still further changed by such slight pressure as can be exerted by the hands alone. What may be the ultimate result of this case I cannot say; but it seemed to me there was no alternative but the attempt I have thus made to bring the sole of the foot into a more natural position in relation to the axis of the leg, or to have removed the foot itself by some form of amputation. The patient was very anxious to avoid the latter alternative, but we have yet to see how far the leg will be of use to him, which I trust I may be able to report to this Surgical Section at a future meeting.

I must here direct your attention to the peculiar form of the astragalus which I removed in this case, as I show it now as a wet preparation in this bottle. You will note that it illustrates in a marked degree the very interesting observations made by Mr. William Adams many years since, as to the peculiar form which an astragalus acquires in cases of confirmed congenital talipes varus. In a healthy astragalus properly grown and developed in its normal position in reference to the other

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bones of the tarsus, the head and neck of the astragalus may be said to be very nearly in a line with the antero-posterior axis of the trochlear surface. But in the astragalus of a newly born child with talipes varus, there will be observed a peculiar bending or angular curve in the bone, by which the axis of the head and the axis of the body or trochlear surface are placed at a very conspicuous angle to each other. And this is well seen in this preparation, where, from confirmed growth in an abnormal direction, the bone has that peculiar curved or twisted form which Mr. Adams has so well described.

REMARKS ON RESECTION OF THE TARSAL BONES FOR TALIPES.*

By JAMES F. WEST, F.R.C.S.,

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THE lecture on excision of the cuboid bone for exaggerated cases of talipes equino-varus by Mr. Richard Davy of the Westminster Hospital, which was published in the BRITISH MEDICAL JOURNAL of April 29th, 1876, together with the abstract of a lecture, also by Mr. Davy, on the same subject, in that JOURNAL for December 15th, 1877, and the case of resection of the tarsal bones for congenital talipes equino-varus brought before the Royal Medical and Chirurgical Society on October 10th, 1876, by Mr. Davies-Colley of Guy's Hospital, having drawn my attention to the possibility of relieving deformity in old and severe cases of talipes, I determined to test the value of operative procedure by bone-resection on the first suitable case that came under my notice.

The intractability and relapsing character of club-foot, notwithstanding division of plantar fascia and tendons, and the expense to poor patients of procuring suitable instruments, as well as the necessity for prolonged surgical treatment, fully justify some attempt at relief by other measures than the ordinary treatment by tenotomy and mechanical appliances.

The procedure which Mr. Davy first adopted was resection of the cuboid alone, and he reported three cases in patients aged respectively 15, 9, and 14 years, where it had answered well. Subsequently (in 1877) he was "ready to defend, not only ablation of the cuboid, but an accurate removal of a wedge-shaped block of the tarsal arch"; such wedge embracing the cuboid, the head of the astragalus, part of the scaphoid, the base of the metatarsal bone, and a chip of the external cuneiform bone. Two cases operated on by him after this manner support the opinion in favour of resection of the tarsus, which Mr. Davy had enunciated.

From the results which ensued in Mr. Davy's cases, also in the one reported by Mr. Davies-Colley, and in the patient whose history I now bring forward, I think surgeons will be justified in resorting to similar operative measures in analogous cases, and in looking upon any patient with club-foot, whatever his age or however great the severity of the deformity, as remediable, if not perfectly curable, by resection of one or more of the bones of the tarsus. The operation may be rendered bloodless, or comparatively so, by the use of Esmarch's bandage, and the antiseptic method of treating such operative cases deprives them of the danger which would otherwise accrue from opening so many joints and synovial sheaths without such precautionary measures.

Tenotomy will remain, as before, the operation for the relief of club-foot in children and infants; but in adults, and in many of the severe forms of talipes, where tenotomy has been resorted to and has failed, resection of one or other of the tarsal bones will be found an useful addition to our catalogue of surgical operations.

The bones at first removed in my patient (whose age was 23) were the cuboid and the astragalus; but, as I found the shape of the foot could not be restored without also taking away the scaphoid, I did not hesitate to resect that bone also. As far as one can judge, after the lapse of ten weeks, the patient is likely to have an useful limb instead of being for life a cripple, and of suffering constant pain from ulceration of the structures on the outer side of the foot, on which she had been obliged from infancy to walk.

So favourable a result in an adult could not possibly have been attained by tenotomy, as the shape of the bones removed, which are now exhibited along with models of the limb, the one taken before the operation and the other quite recently, forbid the belief that, if they had remained, the foot could have ever been restored to its normal shape and position.

* Read in the Section of Surgery at the Annual Meeting of the British Medical Association in Bath, August 1873.

Resection of Tarsal Bones for Talipes Equino-Varus in an Adult.—Annie G., aged 23, single, was admitted into the Queen's Hospital under the care of Mr. West, on May 13th, 1878. Her family history was good. She was born with her left foot turned inwards. On admission, she was suffering from talipes equino-varus. Her foot had always been painful, and more so in damp weather. Till sixteen weeks ago, she was able to walk about, but since that time she had not been able to bear any weight on it, because of the great pain which exercise produced. The tendo Achillis was contracted, as also were the tendons of the tibialis anticus and tibialis posticus, drawing the foot upwards and inwards so that the outer border of the foot rested on the ground when she tried to walk. The plantar fascia was contracted. The ungual phalanx of the second toe was drawn inwards and overlapped the great toe. The skin on the outer border of the foot was much thicker from walking on it, and there was slight ulceration of the skin at the base of the fifth toe. It was almost impossible to say what was the position of the tarsal bones.

May 19th. After some consideration of the comparative merits of resection and tenotomy in long standing congenital equino-varus, the former was decided upon. The patient being anaesthetised by ether, a semilunar incision was made on the outer side of the foot over the supposed position of the cuboid. After division of the ligaments, that bone was removed with great trouble owing to its altered position and relations. The astragalus was then excised, and the tendons around the ankle forcibly stretched. The scaphoid bone appearing to nullify all my endeavours to get the foot into a good position, was also removed. The skin-flaps were carefully adjusted and retained by sutures, after a drainage-tube had been introduced into the cavity of the tarsus. The operation was conducted under the carbolic spray. The hæmorrhage, which was somewhat extensive, was quickly subdued by the pressure of the dressings. An outside splint was applied.

May 20th. The patient had suffered a good deal of pain. On removing the dressing, the wound was not perfectly antiseptic. The foot was in a good position. The patient was well in health; the discharge was free. Lister's treatment was continued.

May 24th. The wound was dressed every second day. The discharge was copious, the wound was healthy, and free from unpleasant odour.

May 30th. The discharge was diminishing; the patient's condition was good.

June 6th. The discharge was much less. The line of incision was granulating freely; the limb was less painful.

June 12th. The patient was going on well, both locally and constitutionally. The foot was placed on an anterior splint and swung in a cradle, to improve its position.

June 19th. The granulations, which were exuberant, were ordered to be touched with sulphate of copper.

June 26th. Antiseptic dressing was discontinued. The foot and leg were ordered to be put up in a plaster-of-Paris case, the patient being placed under chloroform in order to prevent pain while the limb was being put in its natural position. A window was decided to be cut over the wound of incision, so that it might be dressed daily with red lotion.

July 9th. The plaster case was removed, as by its pressure it had caused an abscess on the back of the heel, from which escaped about half an ounce of pus; a drainage-tube was introduced, and stygium applied. The limb was ordered to be laid on a pillow, and no apparatus used for twenty-four hours.

July 10th. A gutta-percha splint was applied to the front of the limb; the dressing was repeated as before.

July 15th. Another small abscess having formed in the outer ankle, it was opened and dressed with stygium; an inside gutta-percha splint was applied.

July 30th. The openings were dressed every day with red lotion and were doing well. The original wound was quite healed by August 5th, and a light starch case was then applied, in which the patient was able to walk a little.

Note.—I beg also to call attention to Mr. E. Lund's paper on the same subject, which was read at the Birmingham meeting of the British Medical Association, and which I ought to have mentioned before, as, being one of the local secretaries of that meeting, I had the opportunity of hearing the paper discussed. Mr. Lund ingeniously removed the astragali in a severe case of talipes equino-varus, where ordinary treatment had failed (see BRITISH MEDICAL JOURNAL, 1872, vol. ii, page 438). In my case, I believe that mere resection of the astragalus would not have sufficed to relieve the deformity, and I certainly think that Mr. Davy's plan of removing a wedge-shaped portion of the tarsus is more likely to be effectual in similar severe or neglected cases of talipes equino-varus.