

end of each suture is now threaded and passed through the ocular conjunctiva, and when all are in position, they are tied, the greatest care being taken that there is not the least tension.

As regards this part of the operation I have used (1) one, two, three and four sutures; (2) no sutures at all, simply placing the transplanted cornea on the patient's eye and applying the dressing; and (3) placing the cornea on the eye without sutures, but putting a single suture through the upper and lower lid and drawing them together for the first two or three days.

Union of the transplanted cornea has been obtained by all of these methods, but I am in favour of either two sutures of the cornea, or a suture of the lids.

The lids are not dusted with iodoform, but simply a cataract pad and bandage applied in the usual way.

*After-treatment.*—Irrigation daily with salt solution after the second day.

The transplanted cornea heals in a striking way, the dog's cornea being larger than that of the patient's, the central part is, so to speak, punched out, the margins coming away as a complete ring in the majority of cases.

The transplanted cornea may become opaque from :—

1. Excessive manipulation, or perhaps also over immersion in salt solution, in from two to five days.

2. From contact with aqueous humour, in from one to three weeks. If the transplanted cornea does not unite at once, hope should not be given up, as in one case a completely detached cornea without sutures united seven days after the operation and remained clear.

*Other operations.*—

1. It has been recommended that a portion of the leucoma should be removed with a trephine, but in this case there is greater danger of opening the anterior chamber with escape of aqueous humour, as the operator cannot possibly judge the varying thickness of the opaque cornea in any particular spot, while after the first flap is raised by transfixion, all the thin and dangerous spots are at once apparent and can be avoided. Moreover, the smaller the area of cornea transplanted in my experiments, the greater was the liability to subsequent opacity. In the above operation the transplanted cornea is considerably larger than the area of the patient's eye to be covered, the central portion is, so to speak, punched out in healing, and the margins which have been of necessity damaged by manipulation are thrown off.

2. Weber states that the opacity of the transplanted flap is due to a solution in the continuity of its posterior epithelium, whereby the aqueous humour gains entrance to the substance of the cornea, but from my experiments, I conclude that contact of the patient's aqueous humour with the transplanted flap will cause opacity under any circumstances without injury

to the posterior epithelium, as I found the transplanted cornea became opaque, when only a small point of aqueous humour touched its centre, which had been carefully guarded against injury. Aqueous humour coming in contact with the margins of the transplanted cornea, which have been injured by manipulation during removal and placing on the patient's eye, causes more rapid and intense opacity.

3. Von Hippel describes cases in which he excised the leucoma only as deep as the posterior elastic lamina, dissecting off the superficial layers, and leaving this layer and the posterior epithelium intact; this may be possible in cases which have been under previous care and treatment, but to attempt an operation of such precision on the hard cicatricial leucomas seen in Indian hospitals is beyond possibility.

*Results.*—M., age 26, came into hospital absolutely blind, without the least perception of light; on leaving hospital after transplantation of the cornea in both eyes, she had excellent perception of light, and was able to count fingers in a good light. Six months after operation she was able to move about the house and out of doors and attend the calls of nature without help. Results such as these, it may be argued, can hardly be regarded as very satisfactory, and this would be so with a highly civilized people, but to the majority of leucomatous blind in this country who simply require to be able to move about their villages and attend the calls of nature without assistance, I contend that the gain is considerable, and at any rate worth a long and fair trial of the operation.

Another point worth notice is the improvement in appearance of the eye, and I have lately been asked to operate for this reason alone, among the higher classes.

## ANEURISM OF THE COMMON CAROTID ARTERY.

BY O. ST. J. MOSES, M.D., F.R.C.S. (ED.).

*Civil Surgeon, Dhubri.*

ON June 17th, 1906, a man, named Diem Mandal, came to the out-patient's department of the Krishnagar Hospital, in the district of Nadia, Bengal. He was 65 years of age, by caste a Mahomedan, by occupation a cultivator, resident in the village of Jaipur. He complained of a swelling on the left side of his neck which, he said, caused him much inconvenience and pain, especially on pressure, and whenever he turned his head from side to side. He observed the swelling first about three months ago, but was unable to say for certain, that it had not commenced earlier. The general state of his health was, according to him, good, and there was no history of specific or other disease. He complained of no constitutional or other symptoms, of no difficulty in breathing or in swallowing, and he said that

the reason for his coming to hospital for advice, was the pain from which he suffered rather than the deformity which the swelling in such a prominent position, occasioned. The general appearance of the patient was good. The man was fairly well nourished. He had that morning come on foot a distance of six miles or so to hospital, to seek advice. On examination, the patient was found to have a swelling on the part indicated, over the line of the common carotid artery and on a level with the thyroid cartilage. There was neither history nor sign of injury or wound of the neck. The swelling was about the size and shape of a duck's egg; its skin-covered surface projected considerably beyond the general level of the skin of the neck, and the mass was placed evidently behind the plane of the sterno-mastoid muscle which was pushed forward in front of it. Further, it was movable *en masse* over the structures beneath, while the skin and superficial fascia moved freely over the whole swelling beneath. Pressure elicited pain. The mass pulsated synchronously with the heart's beat, but the expansile character of the pulsations, though present, was by no means very distinct. When the left common carotid artery was compressed on the cardiac side of the swelling, the pulsations lessened, though they did not cease, and the mass did not diminish in size to any appreciable extent; nor did pressure on the distal aspect make the mass more tense or the pulsations more marked. No bruit was audible over the site of the affection. The pulse in the left superficial temporal artery was not diminished, delayed or otherwise altered to any noticeable degree as compared with that in the corresponding artery of the opposite side. The vitality of the parts beyond was in no way affected and there were no signs present of congestion and œdema of the distal parts, or of interference with the cerebral circulation, or of irritation of the cervical sympathetic. The œsophagus was evidently not pressed upon, or, at any rate, not to the extent of deglutition being interfered with; and the larynx, though deflected very slightly to the right side of the middle line, was in no way disturbed in its functions. The heart appeared to have undergone a slight compensatory hypertrophy, but was not in any other manner affected, functionally or organically.

The various possible explanations of the swelling having been thoroughly considered, the case was diagnosed as one of fusiform aneurism of the upper part of the common carotid artery, below its point of bifurcation; the patient was admitted to hospital at once, and it was decided to operate on him the following morning.

*Operation.*—The patient, having been carefully prepared beforehand, was anæsthetized by means of chloroform. The operation decided on was that of ligaturing the main vessel on the proximal side and, for doing this, I selected the

high operation or ligature of the vessel above the omo-hyoid. Accordingly, I made the usual incision, about three inches long, in the line of the vessel, with its centre on a level with the cricoid cartilage, going through skin and superficial fascia, including the platysma myoides, and coming upon the deep fascia at the anterior edge of the sterno-mastoid muscle. Owing to the consequent relief of tension in the superficial structures, the sac covered over with deep fascia at once presented itself at the incision along the anterior border of the sterno-mastoid, and, stretched over it, was a small vein going across from superior thyroid to internal jugular trunk. This vein was severed between double ligatures and the deep fascia along the inner margin of the muscle was, owing to the bulging of the sac, carefully nicked and then divided on a director with the cutting edge of the knife turned upwards. The sterno-mastoid muscle having next been drawn outwards and the anterior belly of the omo-hyoid found, the artery was felt pulsating in the angle between the two but within its own sheath over which the descendens hypoglossi was identified running downwards. The sheath of the vessel was opened on the inner side and the artery cleared easily enough on that side, but when it came to dealing similarly with the outer side of the vessel, it was found that the partition of deep fascia, which separated carotid artery in the inner compartment from internal jugular vein in the outer, was firmly adherent to the vessel on either side of it at this level. This necessitated clearing the vessel in its sheath at a somewhat lower level and ligaturing it there after passing the aneurism needle from without inwards and making quite certain that the vagus was not included in the ligature. This step made no change in the size of the swelling or in the pulsations. Moreover, the sac remained so stretched out and its wall so thin, that indeed its feel and appearance gave one the impression that it could not possibly stay intact were the slightest accident to occur during the operation or after it. Further, it seemed to me that the collateral circulation was already at work, judging from the continued pulsation in the superficial temporal artery. Why this should have formed, considering that the channel through the artery and sac was not interrupted prior to the operation, I am unable to say. It may have been an anatomical feature in this case that communications naturally existed, say, between twigs of inferior and superior thyroids, or between superior thyroids of opposite sides, or other branches that usually enter into the collateral circulation after a ligature has been applied to the common carotid; or, it may be that, owing to some degree of impediment to the onward flow of blood in the artery due to the presence of the sac in its course, nature had very kindly allowed a collateral circulation to be established

gradually prior to the date of the operation. Be this as it may, I could, in this instance, see no advantage in leaving the sac as it was, and so I determined to lay it freely open after ligaturing the terminal branches of the common carotid as well as the ascending pharyngeal, above the dilated portion. I was further influenced in favour of this step, knowing that it would in no way interfere with the collateral circulation, present or to be formed, as there were no collateral branches given off between the seat of lower and upper ligatures. So I followed out the plan I have mentioned and next turned my attention to the internal jugular vein ere I attempted to deal with the sac of the aneurism. What I felt about the vein was that, considering the way in which it adhered to the thinned-out wall of the aneurismal sac, it was conceivable enough that a communication might fairly readily come about between the two vessels and complicate matters very seriously indeed. The advantages to be gained by tying the vein above and below its point of adhesion to the sac of the aneurism, in the circumstances of the case, seemed to outweigh any risks connected with such a procedure, and so I went on to carry out the ligature of the vein in the positions I have indicated, passing the needle in each case from within outwards with the usual precautions as to the vagus nerve. This done, I laid open the sac of the aneurism, washed out some dark-coloured blood and subsequently stuffed the cavity with a strip of a septic gauze, the end of which was kept at the uppermost part of the skin wound. The smaller vessels having been secured, the skin incision was sutured with horse-hair from below upwards for all but three-quarters of an inch of its length at the upper end. There was practically no hæmorrhage during the entire operation. I may mention that very carefully sterilized, stout silk ligature was used for the large vessels and chromicized carbolized catgut employed for the smaller twigs. Early in the operation two small veins required severing between double ligatures, and a few arterial twigs, of no surgical importance, needed to be tied, probably coming from the superior thyroid and muscular branches. As was stated before, the descendens hypoglossi and the vagus nerves were carefully avoided from being injured or included in the ligature. A point worthy of note is that the patient did not bear chloroform very well, but with judicious administration of the anæsthetic and the use of all convenient dispatch in carrying out the various steps of the operation, the case was successfully completed. An aseptic pad was placed over the wound in the neck and ordinary dressings were applied.

*After-treatment.*—The patient was kept at perfect rest flat in bed, without any food at all for the first 12 hours and thereafter was fed on teaspoonfuls of iced milk at intervals. A little restlessness was easily set right by means of a

hypodermic injection of morphine, which further served the useful purpose of slightly depressing the vaso-motor centres and quieting the action of the heart. The pulse was all that could be desired; there was no temperature, no discomfort or pain. After 48 hours I changed the dressings and found the condition of things most satisfactory. There was no complaint of any kind whatsoever made by the patient, and there had not been the slightest difficulty in breathing, speaking or swallowing at any time since the operation. Healing of the skin-wound by first intention had already advanced considerably. The gauze plug was removed and replaced by a fresh one. The patient's chest was carefully percussed and ausculted without any sign of trouble being detected, while every precaution was taken to protect him against chills, so as to avoid all risks of pulmonary complications. From the third day after the operation the dressings were changed daily and each time the healing of the deep wound was found to have progressed further, the plug being shortened to allow of this, and the patient was permitted a more liberal diet. The only discharge consisted of a very small quantity of thin watery serum with a slightly sanious tinge. On the seventh day after the operation June (25th), the healing had so far taken place, that beyond a sinus, about half an inch in depth, and a superficial linear scar extending downwards from it for about two and-a-half inches, nothing remained to mark the site of the trouble that had existed until a week previously. The patient was able to feed himself, to walk from his bed to the end of the ward and indeed asked to be allowed to go home. On the 26th he said to me he felt a new man since he had been relieved of the pain and the uncomfortable swelling he used to have. When asked, if he intended returning to his usual vocation again on leaving hospital, he answered "without a doubt, for if I could work till the day before I came to hospital when I had so much pain, why should I not be able to work now when I am so much better?"

From the days of Claudius Galen, who was probably the first author to treat of aneurism, the subject concerning this affection of arteries has been much studied, and knowledge regarding its etiology, pathology and treatment has very greatly improved. So far as its etiology and pathology are concerned, the case I have described illustrates only such circumstances as are at the present day universally known to enter into the causation and to be associated with the presence of a fusiform aneurism of a medium-sized artery. Here is the case of a man of advanced years, with an arterial system which has undoubtedly undergone changes of a general degenerative nature, with a power of heart and blood-pressure by no means diminished, and engaged in an occupation of a kind that no doubt frequently called forth heavy strains or irregular intermittent efforts of a

physical nature. So far as these points go and inasmuch as the treatment of aneurism of this vessel has frequently been undertaken and successfully carried out of late, that is, since the days of Syme, there is no occasion to report particularly on this case. But, considering that at best the treatment of the condition by operation is a formidable one, taking into account that the mortality of the ligature of the common carotid artery for aneurism is as yet high, as pointed out by Mr. Johnson Smith, quoting from the tables of M. Lefort, and seeing that the case now described showed certain peculiarities with regard to the anatomical disposition of the parts concerned, I have ventured to think that an account of it and of the special plan adopted in dealing with it, may be of some interest, and therefore worthy of being recounted. Whether under the circumstances mentioned, the distal ligatures in the case of the artery were necessary or, at any rate, advisable or not, whether again the tying of the vein above and below its point of adhesion to the aneurismal sac were essential or desirable, I leave to the judgment of surgeons of greater experience. But so far I am able to say, that the methods I adopted were the outcome of discretion on seeing the state of affairs actually present at the time of the operation, and they seem to have been justified by the resulting of the case in a recovery, unqualified and uncomplicated.

#### EXTRA-PERITONEAL TRANSPLANTATION OF URETERS INTO THE RECTUM.

BY T. V. ARMUGAM, M.B. & C.M.

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On the 11th August 1906, an adult male of 18 years of age, Raghavachar by name, was admitted into Victoria Hospital for complete extroversion of bladder. He was smelling heavily of ammoniacal urine, and on examination was found to have the posterior wall of bladder opening on the surface of the body between the normal situation of the umbilicus (which was absent) and the symphysis pubes which was also absent, the rami of the pubes being  $3\frac{1}{2}$  inches apart. The mucous membrane of the wall of the bladder was thickened and inclined to bleed in parts. There was a ring of ulceration and induration all round the exposed surface of the bladder. The ureters were found opening at the lower part of the exposed mucous membrane on either side of the median line, each on the summit of a papilla, and urine was observed to dribble from the summits of the papillæ at intervals of 15 to 20 seconds, but not simultaneously from both.

*Operation.*—On the 20th of August 1906, patient having been prepared the previous day, was anæsthetized with chloroform, the external sphincter of the rectum was dilated with fingers, and a medium sized sterilized sponge

with two feet of sterilized tape attached to it was introduced into the rectum as high as possible to prevent the escape of fœcal matter. A sterilized Jacques catheter No. 5 with its eye cut out was introduced into the right ureter to a distance of two inches and fixed to the papilla with a silk suture. With a pair of blunt-pointed scissors the mucous membrane all round the papilla was released, and the ureter was then released to a distance of two inches. The left ureter was similarly dealt with, taking care not to open the peritoneal cavity. The reflexion of the peritoneum was found to be unusually low. The mucous membrane of the bladder was cautiously dissected out. The rectum having been raised by an assistant with his fingers introduced into it, a pair of long dressing forceps was introduced high into the rectum and made to press on the point where it was decided to open the rectum from above. A small opening sufficient to admit No. 5 Jacques catheter was made in the rectum on its right side, and a similar opening was made on its left side.

(In selecting sites for these openings, the precautions mentioned by Mr. Peters, of Toronto, *i.e.*, to select a point as high as possible so as not to exert any traction on the ureters, was particularly observed.) Through the openings made in the rectum the Jacques catheters were gently drawn into the openings until they brought the ureters into which they were sutured; and then the ureters and the catheters were drawn out of the rectum and the papillæ made to project a little (quarter of an inch) beyond the sphincter.

The surface of the bladder from which the mucous membrane was dissected out was packed with antiseptic gauze, and the sponge in the rectum was removed and the patient put to bed. The catheter from the right ureter was passed out on the fifth day and the one from the left on the seventh day. Up to the 34th day of operation the patient was having one fœcal motion and passing urine per anum on an average five times in 24 hours and with a little dribbling of urine from his rectum during sleeping hours. From the 35th day up to the date of discharge from hospital, *i.e.*, the 58th day after operation, patient was having one fœcal motion during the day and passing urine per anum on an average four times between 6 A.M. and 9 P.M., the waking hours. The dribbling of urine from the rectum during sleep stopped on the 34th day of operation, and from that day up to the day of discharge from the hospital, *i.e.*, the 58th day after operation, patient was able to retain urine in the rectum from 9 P.M., until about 5-30 A.M. or 6 A.M., and was passing urine per rectum about four times between 6 A.M. and 9 P.M.

Patient left the hospital very much improved in general health, and has promised to come back for an operation for epispadias.