

in the hospital as well as in patients who had been operated on by other surgeons, so that the growth of such an ulcer cannot have been attributed to our perhaps faulty technique. The danger of the formation of peptic ulcer occurs in the cases of high hydrochloric acid especially apparent in such cases where gastro-enterostomy was not strictly indicated. There are cases in which the history of the patient given by himself points to a gastric ulcer, but in which the signs of gastric ulcer are wanting at the laparotomy. There may be, perhaps, merely a relatively small stenosis of the pylorus—some adhesions or cicatricial tissue in the stomach. In former years it was more easy to decide on gastro-enterostomy in such cases. One regarded it as a safety valve, also a prophylactic against a stenosis occurring later and therefore being more serious. Since H. Braun made us familiar with the serious complication of post-operative peptic ulcer of the jejunum great care is necessary with reference to it. In cases when by autopsy *in vivo* I have found no tangible condition to indicate what one had expected to find judging from the history of the case, and nothing to show what sort of an ulcer it was, I have done an exploratory laparotomy simply and have refrained from doing what we may term a “concession gastro-enterostomy.” Among 16 cases of post-operative peptic ulcers of the jejunum which I have seen following gastro-enterostomies performed in my own clinic and some by other surgeons, a whole series of measures, some of them very complicated, were tried to reproduce normal conditions. Only 2 patients were cured, 4 improved, 3 unknown, 2 unrelieved, and 5 died. So we see that peptic ulcer represents a very serious complication.

8. In cases of ulcer situated at a distance from the pylorus, as well as in cases where there is a high hydrochloric acid value, transverse resection seems to me the operation of choice, as this of all other resections—as, for instance, extirpation methods of operation—gives the best security against subsequent complications. It must be made wherever there is the least suspicion that the tumour under consideration may be of a malignant nature. Of 269 patients on whom gastro-enterostomy was performed in my clinic, and who could be kept under observation for some time after, 41 died at a later stage of the disease, 13 from carcinoma, whilst 6 died with continuance of the symptoms of the ulcer. These later deaths speak decidedly in favour of the radical operation. Transverse stomach resection is also the correct operation when the ulcer has invaded neighbouring organs, as nothing except removal of the ulcer will be of any real assistance. Transverse resection as planned by Riedel, also warmly advocated by Payr and Küttner, is a relatively safe operation. We have up to January, 1914, done 11 transverse resections, to which 6 more cases can be added up to July 1st, making 17, and not a single death. I have never seen a peptic ulcer or any other harm after this operation. When transverse resection cannot be done method Billroth II. should be employed. Method Billroth I. is the third in order to be considered. Partial excision is to be entirely rejected.

In extreme cases only when other operations are not feasible, jejunostomy may be considered—as has been already suggested in cases of perforated ulcer, when the patient is so weak that he must be fed immediately after the

operation. Jejunostomy makes it possible for nourishment to be given even on the operation table. Further, in cases of peptic ulcer in which for exceptional reasons excision is not possible, it is the easiest and most rapid of all operations for gastric ulcers, and above all it leaves the stomach undisturbed. As it has only been done in extreme cases one cannot wonder it has met with so little success, and that it is noticeable that so many cases of peritonitis have been associated with it. They were patients whose peritoneum had lost its power of resistance.

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INTERNAL DERANGEMENTS OF THE KNEE.¹

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WHEN your indefatigable and most persuasive secretary commanded me to deliver a short address before this large and representative body of surgeons I was elated by the honour but oppressed by the responsibility, but Dr. Martin told me that all I had to do was to relate my experiences, tersely and authoritatively. Twenty years ago I could have been as authoritative as one wished, for at that time I was less conscious of the need of experience. I have chosen the subject of derangement of the knee-joint because comparatively so little has been written about it in your own country, and this has always been a matter of great surprise to me, for your games like our own are rough, and we in England know to our cost that your youth are very skilled and very strenuous. I am credibly informed that the anatomy of their knee-joints differs but little from our own, and I am forced to conclude either that their cartilages are more securely placed than ours, or, which is most unlikely, that the condition is not so generally recognised as it should be.

By far the most common derangement of the knee is injury to the internal semilunar cartilage. It occurs eight times as often as does injury to the external meniscus. The internal cartilage is more firmly fixed and is not allowed the give-and-take movement vouchsafed the external, and in addition it bears a greater strain during the normal movements of the joint, often becoming thinned and frayed along its inner margin. The line of force is carried through the inner side of the knee in the normal relation of the femur to the tibia, while the abducted position of the foot when exaggerated produces outward rotation of the leg. The disproportion may be also due to the shape of the internal articular surface of the tibia which allows the internal condyle of the femur to glide backwards; thus the range of internal rotation of the femur on the tibia, which is a direct strain on the semilunar, is greater than that of external rotation. In nearly all cases the cartilage is displaced inwards, and on those rare occasions where a protrusion has been felt from the outside it is due to hæmorrhage following a

¹ A paper read before the Clinical Congress of Surgeons of North America, London, July 23th, 1914.

tear, a localised bruising of tissue or a buckling of cartilage accompanied by effusion which gives rise to an irregular outline of the articular margin. The most constant symptom of a displaced or fractured semilunar is a sudden inability to extend the knee. This generally comes on immediately after injury, and the fact is important from its legal aspect. The most frequent cause of the displacement or fracture is strain thrown on the internal lateral ligament while the knee is flexed and the tibia rotated outwards. In rare instances I have known a displacement occur while the knee is fully extended. The force necessary to cause the derangement in a first injury is usually severe, and the pain is acute. The injury may often be met with on the football field. The athlete drops, rolls on the ground nursing his knee. Assisted he hobbles off the ground with his knee flexed. When he arrives home the joint is painful and distended. If the cartilage is still displaced its reduction gives considerable relief from pain. The tender points of pressure are found over the internal lateral ligament and over the anterior horn of the internal semilunar. Any attempt to abduct the limb at the knee is acutely painful. Forced extension of the knee is painful over the site of displacement. If an injured semilunar is rationally treated after its initial displacement it stands a good chance of being completely cured. The first displacement is not often accompanied by any degenerative change; reduction, however, must be absolute. All movements of the cartilage must be prevented until union of the torn structures is complete, and no lateral strain must be allowed until the lateral ligament, so often injured, has had time to effect a recovery. There are many ways of reducing a cartilage, but if no anæsthetic be used I have always thought it wise to summon the assistance of the patient himself. I first fully flex his knee and rotate it inwards. I then tell him at the count of "three" to forcibly extend his own knee while we help him by pressure from above. In this way he materially assists the surgeon and simplifies the reduction. I have often in this way reduced displacements of several weeks' duration, and the reduction can usually be felt by the surgeon. If the displacement be corrected the patient usually knows definitely and at once, and the surgeon, if wise, will abide by his verdict. If the patient tells you the cartilage is still out he is generally right, and it is best to believe him. The knee should remain fully extended after reduction in all recent displacements. If the knee does not voluntarily remain completely extended the displacement is not corrected. Such a joint, with a clear history of semilunar injury, and strained or ruptured internal lateral ligament, should be treated by complete rest in full extension for four or five weeks. Instead of this, the patient is usually allowed to get up and walk in a week or a fortnight. This is a grave mistake, and in a majority of instances lays the foundation for a series of recurrences. The cartilages can only be retained in a fixed position when the limb is fully extended; they participate in all rotary and lateral movements of the joint. Rest of the limb in the fully extended position is therefore indicated, and as long as the effusion lasts the patient should be recumbent. Prolonged effusion relaxes by elongation all the protective structures of the joint; we should therefore aspirate if absorption be retarded. Elongation of the quadriceps with a subsequent weak knee is closely associated with prolonged and recurrent

effusions. Massage can be employed while the knee is being rested in extension, and it is still more valuable to encourage the patient to practise contracting his quadriceps without flexing the joint. When the patient is up we should guard his internal lateral ligament from strain during walking, by directing him to walk with his toe slightly turned in and his foot inverted. This is made easy by raising the heel of his boot a third of an inch on the inner side to deviate body weight from the inner to the outer lateral ligament, just as we would do in an early case of knock-knee.

It is more common to see the case when the acute symptoms are over or when several recurrences have taken place, and we have to depend then upon the history which is usually definite enough. First we hear of an injury, it may be severe or very slight, it usually refers to abduction of the foot, to flexion and external rotation of the tibia. Locking of the knee may have occurred on the first occasion or not—synovitis practically *always* does, but even when locking has not occurred a giving way or slipping is referred to. The story of a reduction makes the diagnosis complete. If the knee be examined a few weeks after the accident the effusion will have gone, but there is often pain on pressure over the internal lateral ligament and above the tibial margin over the anterior horn of the semilunar. Pain is frequently felt in front of the joint on slight hyper-extension of the knee. At a still later stage recurrences and fresh effusions may have occurred accompanied by locking of the joint, the pain on each occasion being capable of definite localisation. Locking is the most definite and reliable symptom, and unless it occurs an element of doubt must always remain. On exploring the knee one frequently finds a fractured or displaced semilunar where there has been no clear history of locking, but the discovery is made, if not with surprise, with a distinct sense of relief. The patient will often only be prepared to admit to a something yielding on the inner side of the knee which gives him a sense of insecurity. This may involve only a momentary inconvenience, or it may occasionally be accompanied by synovitis. He may state that he feels something slip in and out, merely giving him a sense of insecurity. However these symptoms may differ, the one constant fact should remain—namely, that the patient is always definitely clear that the sensation does not change from place to place. The various displacements are often said to be accompanied by a click.

There is no time to deal with the exceptional case which makes the surgery of the knee-joint so fascinating. It is often impossible to diagnose accurately without an operation. Among such abnormal cases I have found the external cartilage on the inner side of the knee, and I have found the fractured end of an internal cartilage lying on the outer side just internal to the external lateral ligament; also cartilages so split up that different segments of the same cartilage would become displaced at separate times, giving rise to distinctive symptoms. Frequently I have found two separate lesions, either of which would account for the symptoms, and unless both were rectified the operation might have failed. Sometimes fringes and lipomata and pedunculated semi-detached bodies have been present when I have expected a displaced cartilage, and I have sometimes even had to close my wound without having remedied any

defect. These confessions show that the knee is sometimes as secretive as the abdomen.

The symptoms are less acute in their primary onset in synovial fringes, the pain is quite local, and is not situated definitely in the internal lateral ligament. Creaking in the joint is common, and effusion almost invariably follows each nipping. There is usually in the recurrent case a thickening on each side of the ligament of the patella due to hypertrophy of the post-patellar pad of fat. One may expect to find synovial fringes attached to a post-patellar pad in cases of recurrent synovitis of the knee where the pad is found thickened and where occasional twinges occur in front of the joint. Loose bodies lock the knee sometimes, but usually only for a brief moment, and the symptoms, although sharp, are not acute. They can always be differentiated, because unless pedunculated they can be isolated in different parts of the joint, although they usually have a favourite resting place. They can generally be demonstrated by radiography. I have known lipomata to lock the knee, but the symptoms they produce are rarely acute. They are often accompanied by painless effusions, and can generally be felt in the pouches. An osteoma can usually be detected by careful examination. It can be felt and radiographed. It is the means of locking a joint when a muscle or tendon slips over it, but the locking is never accompanied by effusion. There is a type of knee which clicks on full extension, and wherever you place your finger the clicking seems immediately under it. This is sometimes due to a nodular condition of the anterior portion of the semilunar, but often it will be found associated with a slipping in and out of the external cartilage very clearly to be felt by placing the finger in the depression between the bones.

I refuse to operate upon any case which I see immediately after the first displacement, as so large a proportion of such cases get well under appropriate treatment, nor do I encourage operation in cases where the recurrent trouble is painless and is never followed by effusion in the joint. I strongly advocate operation where the recurrence is sometimes followed by acute symptoms and I encourage it in all recurrent cases where a strenuous athletic life is a means of livelihood or a physical necessity. Operation is a positive necessity in the case of men who work among moving machinery or stand in positions where a yielding knee may mean disaster. I have operated upon patients from 12 to 60 years; age, therefore, is not a contra-indication. An argument in favour of operation is the occurrence of tubercle and so-called rheumatoid trouble as a direct result of the irritation of a displaced cartilage. If I decide to operate I prefer to do so with the knee flexed to right angles, so that it need not be further flexed during the operation. I have a very real dread of accidental infection of a knee-joint, for it may mean the loss of limb. Further, I consider a knee which has been the seat of trauma as very susceptible to infection, and am therefore careful not to operate during the presence of effusion nor to move it during operation for fear of the ingress of air or dust. The most convenient way is to have the limb hanging in flexion over the end of the operating table. Some thicknesses of gauze, squeezed out of a solution of biniodide of mercury, are wrapped round the joint and the incision is made through the gauze, the cut edges of which are fixed into the wound. In this

position it is not necessary, excepting in very stout people, to make the incision longer than an inch and a half. The incision I now employ is nearly transverse, commencing just behind the ligament of the patella, and traversing slightly above the tibial border, taking care to spare the internal lateral ligament from injury. Through this small opening a most excellent view can be obtained of the joint with the aid of retractors. The finger should never enter the joint. Neither the surgeon nor his assistant should touch the wound except with sterile instruments; the sutures for the capsule should be manipulated with forceps, the edges of the capsule being secured by a blanket stitch. The cartilage may be found in almost any conceivable position. It may be split along its inner margin; it may be fractured; it may be detached anteriorly; it may be turned inwards, like a bucket handle with its convexity inwards; it may be nodular; the posterior part may be in front; the anterior portion may be loose; it may be attached at its extremities and free along the whole part of its outer border; it may be firmly fixed with its inner border frayed and serrated; the anterior part may be ground away or found quite loose as a separate body; it may look quite normal, but its moorings found loose, or the posterior part may be split, which can only be discovered by detaching the anterior portion and drawing the cartilage towards the front of the joint. The examination should be gentle, and it is made easier by the use of a small blunt hook. It is only necessary to remove the loose portion of cartilage if the remainder be firmly attached. If it be decided not to remove the whole cartilage care should be taken to make the section without drawing upon the stump, otherwise it will be loosened and give rise to symptoms of recurrence. The capsule should not be closed until a search has been made for fringes, tabs, or other possible sources of derangement. I always apply a tourniquet and never tie a vessel nor drain the wound. Effusion, if it occurs, is usually very trivial if the operation has been done gently. As no structures of any importance to the stability of the joint have been severed, walking may commence in from 10 to 14 days, the joint being protected for another week. Loose bodies of whatever type should be removed. An endeavour should first be made to localise and fix them. This should be done immediately before the anæsthetic, when the patient's assistance can be obtained if necessary. The patient's hands should be sterilised and he should wear a mask and rubber gloves, and when found the fixed body should be placed in the keeping of a reliable assistant. The knee should be kept *extended* during this operation. These loose bodies are often found in connexion with rheumatoid arthritis, and should be removed whenever practicable, and this may involve splitting the patella longitudinally to obtain a good view of the interior of the joint. They are frequently found at the back of the joint and obstruct flexion and sometimes extension. They cannot be effectively removed by an anterior incision, and it will be necessary to approach the joint from behind. The narrow communication between the anterior and post portions of the joint prevents them from travelling if they should prove of any size, therefore their removal is not difficult. An incision is made through the popliteal space, the nerve and vessels being kept to the outer side, and usually the loose bodies can be felt through the capsule. This route

has also been described by my friends Brackett and Osgood.

[Mr. Jones concluded his interesting paper by exhibiting slides of the joint conditions of patients upon whom he had operated for obstructions due to the slipping of tendons or muscles over exostoses, and for fractures of the tibial spines, associated or not with rupture of the crucial ligaments, an injury which he also described.]

THE RESULTS OF OPERATION (LARYNGO-FISSURE) FOR INTRINSIC CANCER OF THE LARYNX.¹

BY PROFESSOR E. SCHMIEGELOW.

SURGICAL treatment of intralaryngeal cancer gives exceedingly good results, especially when compared with those obtainable by surgical treatment of cancer in other internal organs. On examining this fact we find it to be due to the peculiar manner in which intrinsic cancer of the larynx originates and develops and spreads, as was originally pointed out by my friend Sir Felix Semon. It would be interesting historically to consider the development of the pathology, diagnosis, and treatment of intrinsic cancer of the larynx, but lack of time forbids me doing so. I may, however, be permitted to state here in London, speaking to an assembly of prominent American and English surgeons, that in my opinion the whole of our present knowledge of the diagnosis and treatment of this disease is founded on the works of Semon and Butlin, who, towards the end of last century, entirely revolutionised our views with regard to the malignancy of intralaryngeal cancer. Before their day the surgical treatment of this disease had always been regarded as almost hopeless, but Semon showed us that the chief reason of this was that the disease was always diagnosed too late, so that it was too far advanced to give any good operative result.

Having further learnt that intralaryngeal cancer in the great majority of cases appears as a primary cancer of the vocal cord, and therefore soon causes hoarseness, we have thus the means of recognising the disease at an early stage of its development, while still limited to the vocal cord, and so of a probable radical cure by removing the diseased vocal cord through a laryngo-fissure.

To illustrate the frequency of primary cancer of the vocal cord I wish to draw your attention to the following table of 66 cases of intralaryngeal cancer which have come under my observation (Table I.).

TABLE I.—*Primary Seat of Intralaryngeal Cancer.*

No specified localisation	...	...	...	...	...	18	cases.
Vocal cord	...	...	...	...	...	36	„
Sinus Morgagni	...	...	...	...	...	2	„
Arytenoid region	...	...	...	...	...	4	„
Epiglottis	...	...	...	...	...	1	„
Ventricular band	...	...	...	...	...	5	„
						66	„

In the first 18 cases the primary seat of the disease could not be localised, as the tumour had extended too far into the larynx when first observed. The table clearly shows that cancer of the interior of the larynx in by far the majority of cases originates as a growth of one vocal cord, generally in the central part of it, and that it can therefore be radically removed. If the disease, however, has extended to the anterior commissure the prognosis

becomes more serious, as under these circumstances the thyrotomy cuts through the growth and may possibly be followed by a recurrence.

Those cancers of the larynx which do not primarily attack the vocal cords have, on the contrary, a bad prognosis; first, because they very often are not discovered and taken in hand until they have spread so far that there is no possibility of a radical cure by means of a laryngo-fissure; secondly, because these extra-cordal cancers are generally of a more soft medullary character, growing quickly and with greater tendency to involvement of the neighbouring lymphatic glands. The only exceptions to this are the pedunculated adeno-carcinomas which spring from the aryteno-epiglottic folds. Of these I have seen three cases which had a relatively good prognosis, and could be treated endolaryngeally with favourable results.

Having made the diagnosis by means of laryngoscopic inspection, supported by microscopic examination of a portion removed through the mouth, one has to remove the growth as soon as possible by means of a laryngo-fissure. This operation should be performed as indicated by Butlin and Semon, who, about 1890, inaugurated this treatment and proved that this comparatively safe operation was sufficient, if only performed early enough. I myself, chiefly following their instructions, have operated in the following manner.

The operation is always performed under general anaesthesia. I begin with morphia-ether and make a low tracheotomy. Hahn's tampon-cannula is introduced and the narcosis is continued with chloroform. The thyroid cartilage having been divided and the interior of the larynx opened, I fill the pharynx with sterilised gauze introduced from below through the split larynx in order to prevent the saliva from descending and interfering with the scene of action. According to Semon the larynx is packed with gauze soaked in a 10 per cent. solution of cocaine, to which I add a few drops of a 1 per mille solution of adrenalin in order to make the mucous membrane of the larynx anaesthetic and bloodless. Then the neoplasm, together with the whole diseased vocal cord, is removed by means of a knife and scissors. All the diseased area having been removed and the bleeding stopped, we formerly filled the larynx with a tampon of iodoform gauze, but after Butlin taught us to give up tamponading and to close the thyrotomy wound at once the results of operation have been much better. The patients are now able to swallow on the day of operation and can leave their bed a few days later. This, of course, is of the greatest importance in preventing complications in the lungs, especially in elderly people. My two eldest patients, respectively 71 and 74 years old at the time of operation, were able to leave their beds on the second day, and they are both alive and well now at the ages of 76 and 80 years respectively. Thyrotomy could only be performed in 33 of my cases treated up to 1912, as shown in the following table (Table II.):—

TABLE II.—*Results in 70 Cases of Cancer of Larynx (Extrinsic and Intrinsic).*

	Cases.	Cured.	Died or relapsed.
No treatment	10	0	10
Tracheotomy	8	0	8
Endolaryngeal removal	5	1	4
Thyrotomy	33	18	15
Subhyoid pharyngotomy	1	0	1
Partial resection of the larynx	4	0	4
Total resection	9	1	8
Totals	70	20	50

¹ A paper read before the Clinical Congress of Surgeons of North America, London, July 28th, 1914.