

all, nine years ago) this operation has so shrunken the mass and so deprived it of blood as to permit, after a short time, an extirpation of the tumor, partial or complete, not otherwise possible.

Within the past month a letter has been received from Dr. J. Chalmers DaCosta covering exactly this point. I quote from it by permission. A patient from Texas with carcinoma of the face had been seen by two distinguished Philadelphia surgeons. The growth was then too extensive to be excised, and hence operation was declined by them. Dr. DaCosta performed the carotid excision on both sides last winter. "The subsequent shrinkage was gradual, but certain," he writes; "masses of fibrous tissue were developed about it." A few weeks later he was able to perform an apparently complete removal of this cancer. His concluding words express the idea under discussion, and which represents, it may be, as practical a value to us as any in this starvation work, namely: "This use of the operation, bringing, as in this instance it did, an at first inoperable growth into the range of operation, seems to me a very important and interesting phase of the matter."

DISCUSSION.

DR. A. T. BRISTOW, Brooklyn, N. Y.—I have performed this operation eleven times on six patients, the twelfth operation being done by my assistant, Dr. Campbell. In only one of these cases was the disease sarcoma, and in this case the patient died a short time after the second operation; therefore, I can not speak from experience of the curative value of the operation in this class of cases. All the remaining cases were carcinomata, four occurring in the upper jaw, springing from the antrum. One case was an epithelioma of the lip, which had involved the lower jaw and was inoperable. In all these cases I noticed that the pain of which the patients complained ceased after operation. Shrinkage of the tumor also took place, and there was much diminution in the discharge from the cancerous mass. One of my cases was alive at the end of a year. Another I kept under observation for four months. The disease at this time was stationary. Judging from my own experience of two sudden deaths occurring one shortly after the operation and one in a case not here included, but done by Dr. Campbell at St. John's Hospital, I am obliged to come to the conclusion that there is a risk attached to this procedure which is out of proportion to the dissection. We constantly, particularly in cases of tubercular adenitis, make dissections of the neck which are far wider and more extensive, yet there is no mortality in these cases. All my cases suffered from respiratory failure when the stump of the vessel was made to take the dive beneath the hypoglossal nerve. They all recovered, but the case which my colleague lost died at this point in the operation from complete failure of respiration. I am inclined to think that interference with the superior laryngeal by the traction may bring about pneumogastric inhibition. The operation is sometimes easy, sometimes very difficult, and, of course, should only be resorted to in cases inoperable by ordinary methods.

DR. DAWBARN—I am sorry Dr. DaCosta is not here, as he was, at my request, the first surgeon to practice this method. As Dr. Bristow has said, and I agree, there is a sudden and complete cessation of excessive pain after external carotid excisions for malignancy, and in many cases the patients will be very thankful for a few weeks more of life, and without pain, in which to settle up his affairs. I have referred in my paper to one personal case where such a decided shrinkage took place that an operation was made possible. As to the question of mortality, although I have done the operation about 60 times, I find it very difficult to estimate mortality. We must remember that this operation is always done as a last resort in cachectic subjects, often with masses of diseased and adherent glands over the carotids, and it is a choice between this attempt and a coffin. Simple, uncomplicated ligation of both external carotids may be said to be devoid of mortality; certainly it is well below 1 per cent. in skilled hands; and excision of both

these arteries in non-complicated cases, with a fair degree of vital power remaining, should not, with skillful work, result in more than 5 per cent. of mortality.

THE INFLUENCE OF THE ADIPOSE TISSUE WITH REGARD TO THE PATHOLOGY OF THE KNEE JOINT.*

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Disturbances of the knee joint caused by the adipose tissue have already been described in some cases by Johannes Müller as *lipoma arborescens*, and by König as *lipoma solitarium*. The former disease is determined by the exuberant growth of fat villi, sometimes to such an extent that they fill up the joint and cause an expansion of the capsule. Schuchardt was the first to show by his microscopic researches that these conditions had nothing to do with tuberculosis of the knee joint.

The *lipoma arborescens* is no real tumor like the *lipoma solitarium* of König, which varies from the size of a cherry to that of a walnut and is generally situated on the median side of the joint, with a pedicle reaching into the joint itself. König thinks these tumors originate in the subsynovial fat tissue, and compares them in this respect to the *lipoma subperitoneal*. They have been removed by König, Volkmann and others, and are supposed to result from some trauma of the synovial membrane effecting a slit through which the parasynovial and retrosynovial adipose tissue escape into the joint. These tumors are certainly not all real tumors, and I would rather class them as an inflammatory fibrous hyperplasia of the articular adipose tissue, which, according to my experience, is an important factor in causing disturbances of the knee joint. I first came across this hyperplasia of the fat tissue some years ago on incising a knee joint for the sake of extirpating the detached meniscus, as I thought, which, however, was intact, and subsequently a great many similar cases were diagnosed by me beforehand showing this hyperplasia of the fat tissue beneath the *ligamentum patellæ* quite typical.

The sound knee joint presents the following anatomic conditions: Under the *ligamentum patellæ* the synovial membrane shows two plicæ alares and a plica *synovialis patellaris*. The former consist of fat tissue with a coating from the *synovialis*, which stretches from the front margin of the tibia like a fat lobule into the joint, and even sideways beyond the *ligamentum patellæ*. From the central summit of the plica *alaris* originates the plica *synovialis*, which is composed of fibrous fat tissue inserted at the *fossa intercondyloïdæ*. A sagittal section of the knee joint shows this fatty tissue situated like a wedge between the patella, femur and tibia. While the upper part adheres to the *ligamentum patellæ*, the lower is separated from it by the intervening bursa *infrapatellaris profunda* and joins the meniscus, also being connected to the periosteum of the front part of the tibia. I have dissected a large number of normal knee joints and always found the above conditions from early childhood upward, the growth of the adipose tissue varying individually, sometimes cachectic individuals showing a larger growth than fat persons.

A section of this fat tissue shows an extensive delicate network of fibrous strings interspersed with fat lobules,

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the surface being covered with a single layer of endothelial cells and small villi, increasing in number from the central parts toward the surface. These villi consist of a delicate fibrous tissue covered with endothelial cells showing slight vascularity.

This normal adipose tissue is liable to grow and to produce a hyperplasia inflammatoria, even after slight trauma of the knee joint occurring chronically, and can then be felt as a pretty hard mass of fat on both sides of the ligamentum patellæ, similar to a lipoma. These growths, I found, differ widely from the normal adipose tissue as regards size, color and solidity.

The growths that I have removed have often been larger than an egg, and, beside the normal color, they show a reddish-yellow tinge, indicating hemorrhages. I have also come across regular blood clots enclosing the above-mentioned villi when the operation was performed immediately after severe attacks of pain. The adipose tissue is much more solid than you usually find it on account of the strong fibrous tissue. A section shows very markedly a network of these solid strings enclosing the enlarged lumina of blood vessels. My assistant, Dr. I. A. Becker, has described the histologic details of these cases, and I shall only give you a short summary of our investigations.

In the beginning of the process, beside centers of cellular infiltration, there are found fibrous tissue cells, leucocytes and perivascular cells, with endothelial cells winding along the surface of the increasing number of villi. The blood vessels are filled and extravasation into the surrounding tissue has taken place.

Later on you see the inflammatory process marked by granulation cells, which gradually take the place of the fat tissue, forming fibrous strings and showing the residues of hemorrhage, sometimes with pigment cells and even extensive necrosis, so that after a time the endothelial cells are joined immediately to the fibrous tissue without any intervening fat.

This process is characteristic of an inflammatory hyperplasia of the adipose tissue interspersed with strong fibrous strings, and is generally caused by some trauma, either a fall on the knee or some other hurt, such as a sudden jerk, etc. The hemorrhage must be considered as primary, followed by inflammation and exuberant growth of the villi, which are liable to be crushed between the tibia and femur, and this strangulation of the villi regularly makes the patient consult the doctor, showing symptoms quite similar to those of floating bodies of the joint.

The pain is felt quite suddenly on the median side of the joint; the knee can either not be bent or the patient is not able to stretch it. Hemorrhage into the joint itself may have taken place, but this is not generally the case. After a time an atrophy of the quadriceps muscle is more or less developed, and there is a typical swelling of the knee joint on both sides of the patella, especially in its lower part, where the ligamentum patellæ insert, which is often raised by this growth, showing pseudofluctuation. The patient should be examined standing and both knees compared. There is no discharge into the joint, whose power of motion is generally unimpaired, only presenting a slight crepitation, very different from that of arthritis.

DIAGNOSIS.

The diagnosis of these cases is not difficult, and they can be separated from the cases of derangement interne, of separation of the meniscus or of floating bodies. Separation of the meniscus causes the patient to localize the

pain exactly within the joint cleft; floating bodies may be determined by Röntgen rays, while in our cases there is perhaps just a slight indication of a shadow within the otherwise clear space between patella, femur and tibia. In all my twenty-one cases which I have observed within the last year and a half, except the first, where a separation of the meniscus was diagnosed, I was able to confirm the diagnosis made beforehand by a subsequent operation.

These observations have also been made by other surgeons, but mostly accidentally while operating for floating bodies or other disturbances of the knee joint. Thus König, in the festive paper for the celebration of v. Es-march's eightieth birthday, mentions having cured an officer by extirpating one of these villi.

Similar cases have been published by Herhold and Lauenstein, the latter's case being complicated by a fracture of the patella; also Börner, Martens and the American surgeons, Painter, Goldthwait and Ewing, have published observations similar to these.

TREATMENT.

Operations on these cases should be undertaken after the other methods, such as massage, compression, etc., have been used without success, by an incision on the median side of the patella. Of course, asepsis is a *conditio sine qua non*, and I have always followed König's "golden rule," to avoid bringing my fingers into contact with the joint and only to work with as few sterilized instruments as possible.

The result is generally very satisfactory, as the disturbance caused by these growths is removed, together with their extirpation, and the operation, carried out under the necessary aseptic conditions, is without danger.

For the first twenty-four hours after the operation I mostly use a small sterilized gauze strip as a drain to the joint. After eight days the sutures are removed and the patients may walk about, movements and massage being soon applied. The full use of the leg is secured in from six to eight weeks.

I can certainly recommend this operation, especially in such cases where other appliances have been resorted to in vain, and I have been able to remove very severe symptoms and definitely heal my patients by this method.

TWINE IN LIEU OF THE ELASTIC LIGATURE FOR PERFORMING GASTROENTEROSTOMY.*

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During the past winter two innovations have been practiced at the surgical laboratory of Columbia University. They consisted in the carrying out of suggestions¹ made in a previous communication from the laboratory, to-wit: First, that gastroenterostomy might be successfully practiced with the use of a triangular instead of a quadrangular stitch; and second, that the material for inserting the stitch might be twine instead of the elastic ligature.

Weir objected to the technic as originally devised by

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1. As has before been stated, the original impetus for this investigation, as in the case of so many others, was furnished by Dr. Robert F. Weir. I take this opportunity to thank him for many helpful suggestions and for unflinching encouragement.