REMARKS ON FATTY TUMOURS.

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ANY tumour composed of fat is called a fatty tumour, but such tumours are of various kinds, arise in any situation, and receive a variety of names. These tumours are by no means restricted to regions where fat is found normally; they may occur in a muscle, or in the midst of a myoma, in connection with the brain, spinal cord, or even grow from periosteum.

For convenient description, fatty tumours may be considered in the following groups: 1, subcutaneous; 2, subserous; 3, sub-synovial; 4, submucous; 5, intermuscular; 6, intramuscular; 7, parosteal.

1. SUBCUTANEOUS LIPOMATA.

Beneath the skin of our bodies exists a layer of fat which varies in thickness in different parts, but is most abundant over the trunk and trunk-end of the limbs. These are the common situations in which to find fatty tumours. They appear under three forms: sessile, pedunculated, or diffuse.

Sessile Lipomata occur as irregular-shaped, often lobulated, indistinctly circumscribed, encapsuled masses of fat more or less adherent to the overlying skin. Unless they have been inflamed, they are movable within their capsules. As a rule, lipomata are single, but ten, twenty, and even a greater number may occur in the same individual. In point of size they vary widely; a fatty tumour, weighing 8 ounces, is usually regarded as a large specimen, but, under exceptional conditions, they have been known to attain a weight of 50, 80, and even 100 lbs. Subcutaneous fatty tumours are for the most part confined to the trunk and trunk-end of the limbs, but they

Fig. 1.—A fatty tumour of the palm of the hand.

may occur in any part of the limbs, even in the palm of the hand. In this situation they are apt to give rise to difficulty in diagnosis, and it may be useful to recapitulate their leading clinical features. They are not limited by age, as fatty tumours from the palm have been removed at the age of 16 years, and as late as 60. The tumour grows slowly, is soft and doughy to the touch, irre-

gular in shape, imparts a sense of fluctuation, and is adherent to the skin. In all cases that I have seen, the tumour was closely associated with the thenar eminence. The general appearance may be inferred from Fig. 1. These tumours closely simulate a compound ganglion of the flexor tendons. The lobes of fat usually burrow beneath the palmar fascia.

Fatty tumours in the sole of the foot are more easy of comprehension than one in the palm of the hand; yet, strange to say, they are more frequent in the hand than the foot; indeed, I only know of one recorded case in this situation.¹

Fig. 2.—A pedunculated lipoma growing from the axilla.

Pedunculated Fatty Tumours are rare in connection with the skin. They occur most frequently on the thigh. The pedicle may be thin and stalk-like, or very thick. An unusual form is sketched

Fig. 3.—Diffuse lipoma.

in Fig. 2, growing from a woman's axilla; the tumours in this case were symmetrical, and resembled supernumerary milk-glands with-

¹ Gay, *Path. Soc. Trans.*, vol. xiv, p. 243.

out nipples. On dissection they were found to consist entirely of coarsely granular fat, permeated with many blood vessels.

Diffuse Lipomata differ from the preceding in several important particulars. In typical specimens they appear as symmetrical swellings in the neck and on each side of the ligamentum nuchæ (Figs. 3 and 4). The fat has a coarsely granular appearance in such tumours, due to its being bound up into tiny lobules, which causes it to resemble omental fat. In the neck these collections are situated on the deep, as well as the superficial, aspect of the platysma. Similar unencapsuled masses of fat often occur in the groin, pubic region, and axillæ of those who are unfortunate enough to possess them in the neck.

Fig. 4.—Diffuse lipoma (after Morraut Baker and Bowlby).

SUBSEROUS LIPOMATA.

The peritoneum, like the skin, rests upon a bed of fat, the thickness of which varies considerably in different situations and in

Fig. 5.—A hernial pouch with a pedunculated subserous lipoma.

individuals. As with subcutaneous tumours, we find three clinical varieties of lipomata arising in this subserous bed of fat: sessile, pedunculated, and diffuse. We may commence our study of these by a consideration of inguinal lipomata. Surgeons have long been aware, in operating for inguinal or femoral hernia, that occasionally they come across masses of fat, and find difficulty in determining whether it be omental, or a local increase of the subserous fat surrounding the hernial sac. It is now clear that in the neighbourhood of the femoral and inguinal canals an overgrowth of the subserous fat may occur and be mistaken for a hernia, and individuals have been recommended to wear, and have actually worn, trusses for fatty tumours of this character. It is also clear that as these local overgrowths of fat arise and protrude in the groin, they occasionally draw with them a pouch of peritoneum unassociated with a hernia. These pouches may subsequently lodge a piece of gut, and become true hernial sacs. Thus peritoneal pouches, produced mechanically by subserous lipomata, may subsequently become hernial sacs, and such lipomata may arise in relation with peritoneal pouches which were originally hernial sacs. In some cases a subserous lipoma of this character will invaginate a peritoneal pouch and form a pedunculated lipoma (Fig. 5). This pouch was removed by Mr. A. Pearce Gould; it is preserved in the museum of the Middlesex Hospital. Such lipomata may arise in connection with inguinal and femoral hernial pouches.² Fatty tumours may arise in the scrotum or labium, and attain a large size unconnected with hernial pouches.

These specimens are of very great interest, for they serve to explain the mode in which appendices epiploicæ arise. These are local overgrowths of subserous fat which project into the peritoneal cavity, forming pedunculated lipomata. As long as they retain average dimensions they are regarded as normal, but sometimes they become very large, and then rank as tumours. This variety of fatty tumour is especially seen in cases of old-standing syphilitic stricture of the rectum; the gut, for twenty inches or more, is covered with clusters of pedunculated fatty fringes, to which

Fig. 6.—"Lipoma arborescens" of the colon.

the term lipoma arborescens of the colon is applicable (Fig. 6). Overgrowth of these subserous fatty fingers is not necessarily associated with stricture, syphilitic or otherwise, and the peculiar dentate appearance they present reminds us of the corpus adiposum of the frog and toad.

Subserous lipomata associated with the colon occur in consequence of emaciation. In a well-nourished subject the appendices epiploicæ are directly continuous with the fat in the layers of the mesentery. When wasting occurs the connecting band of fat atrophies, leaving an adipose nodule at the bottom of a peritoneal pouch. The movements of the intestines and the swinging of the pouch lead to the formation of a pedicle; this may become twisted and so narrowed that an unusual movement will bring about their detachment and set them free in the peritoneal cavity. Occasionally they have been found loose in a hernial sac; sometimes they calcify.

Such tumours are common in oxen and horses; in the latter I have met with them weighing 2 lbs. They have been known to lead in horses to invagination of the bowel and to cause death.

² For some references and an admirable account of hernial lipomata see J. Hutchinson, jun., *Path. Soc. Trans.*, vol. xxxvii, p. 451; vol. xxxix, p. 451.

Fatty tumours arising in the subperitoneal tissue occasionally make themselves evident at the anterior abdominal wall, especially in the neighbourhood of the umbilicus. They are often referred to as "fatty herniæ in the linea alba," as they are often mistaken for omental hernia; as in the case of inguinal lipomata, they sometimes produce peritoneal pouches. This form of sub-

Fig. 7.—Pendulous lipomata of the ascending colon. The pedicles are twisted.

serous lipoma may attain a large size. These tumours further simulate hernia in that the traction they exercise on the peritoneum produces pain. Subserous lipomata occasionally arise on the under aspect of the diaphragm, and pass upwards into the anterior mediastinum through the foramen usually found behind the ensiform cartilage.

Diffuse Subserous Lipomata may attain a great size. In a case reported by Pick,² a mass of fat weighing 29½ lbs., arose in the subserous tissue posterior to the transverse colon, in a man aged 36 years. Mr. Meredith¹ successfully removed by abdominal section, from a woman aged 62 years, an omental lipoma, which weighed 15½ lbs. In 1868 Mr. Cooper Forster³ reported a similar specimen, found after death, in a woman aged 63 years, which weighed 55 lbs. Mr. Hudson has recently reported a retroperitoneal lipoma from a fox terrier bitch weighing 12½ lbs.

SUBSYNOVIAL LIPOMATA.

Beneath the subserous tissue of large joints, such as the knee, there is a layer of fat of varying thickness. This fat may, as in the case of inguinal lipomata, increase in quantity, and projecting into the joint form a fatty tumour. A common situation for this to occur is beside the patella, at the spot normally occupied by the alar ligaments. Many specimens are doubtless due to overgrowth of the fat in the alar fringes, but they may arise in other parts of the joint.

The best known variety of subsynovial fatty tumours is that to which Johannes Müller applied the term "lipoma arborescens." This condition is often, but by no means always, associated with rheumatoid arthritis. A typical specimen from the shoulder-joint is represented in Fig. 8.

SUBMUCOUS LIPOMATA.

Besides subcutaneous, subserous, and subsynovial layers of fatty tissue we find, as Virchow has pointed out, the submucous tissue in many situations laden with fat. In the normal state it is true that no continuous layer of fatty tissue exists in submucous tissue, but fat lobules can always be detected in this situation in well nourished individuals. It is thus easy to understand that abnormal collections of fat are possible in connection with mucous membranes. Submucous lipomata have been especially studied by Virchow.⁶ He has figured one beneath the mucous membrane

of the stomach, near the pylorus, of the size of a nut. Also one from the jejunum, and points out that they may become pedunculated and cause invagination of the bowel.

Mr. Sydney Jones⁷ removed a lipoma from the right aryteno-

Fig. 8.—Lipoma arborescens of the shoulder. A, Aclromion. F, Glenoid fossa. C, Coracoid. (Trans. Path. Soc.)

epiglottic fold of a man aged 40 years; it hung down into the pharynx, and the patient could protrude the tumour into the mouth. It was smooth and round, and measured 2 inches in diameter. It was an irregularly lobulated mass of fat; the lobules were held together by connective tissue. It contained a small cyst lined with stratified epithelium.

Laryngeal lipomata are very rare. The most remarkable example on record is one described by Mr. Holt.⁸ The patient, a man, died suddenly; hanging from the left aryteno-epiglottic fold, and from the side of the epiglottis, was a pedunculated tumour, which extended into the œsophagus for a distance of 9 inches. It consisted of fat, and was covered with a layer of mucous membrane.

Fatty tumours are sometimes seen in children beneath the conjunctiva, near its reflection from the lower lid to the eyeball. They may also arise in connection with the orbital fat, and project beneath the conjunctiva in the neighbourhood of the lachrymal gland, and near the insertions of the ocular muscles. Lipomata in this situation are extremely rare.

INTRAMUSCULAR LIPOMATA.

Many examples of fatty tumours found in the midst of a muscle have now been noted, and are of interest from the difficulty they cause in diagnosis. My attention was first directed to this variety of lipoma, by finding one in the middle of the short head of the biceps humeri of an old woman. It was lobulated, and resembled in its general characters a subcutaneous lipoma. It seems anomalous that fatty tumours growing from periosteum often contain striped muscle tissue, but never when growing in a muscle. Fatty tumours have been found in the following muscles: Deltoid⁹ (Mr. Andrew Clark), biceps humeri, and complexus, in the muscle tissue of the heart,¹⁰ in the middle of a myoma of the uterus (Mr. T. Smith).¹¹ A similar specimen has been recorded by Lebert,¹²

⁷ Path. Soc. Trans., vol. xxxii, p. 243.

⁸ Path. Soc. Trans., vol. v, p. 123.

⁹ Museum Middlesex Hospital.

¹⁰ For lipomata in the heart see Handford, Path. Soc. Trans., vol. xxxviii, p. 108.

¹¹ Path. Soc. Trans., vol. xii, p. 128.

¹² Trait. de Pathol., pl. xvi, fig. 11, tom. i, p. 128.

² Path. Soc. Trans., vol. xx, p. 337.

⁴ Clin. Soc. Trans., vol. xx, p. 206.

⁵ Path. Soc. Trans., vol. xix.

⁶ Tumeurs, tome i, pp. 369 and 378.

which occupied the middle of a uterine fibroid the size of a billiard ball.

INTERMUSCULAR LIPOMATA.

Fatty tumours also arise in the connective tissue between muscles, and in such situations may attain a very large size. They have been found between the greater and lesser pectorals; several have been removed from between the muscles of the tongue,¹³ and very large ones from the intermuscular stratum between the oblique muscles of the abdomen.¹⁴

One of the most remarkable belonging to this variety is that known as the sucking-cushion. In dissecting the cheeks we find lodged between the masseter muscle and the buccinator a mass of fat, which comes, anteriorly, in close relation with the ordinary subcutaneous tissue of the cheek. This fat is lobulated, and during dissection may be easily shelled out by means of forceps; it is often termed the *boule grasseuse de Bichat*. Ranke¹⁵ has

Fig. 9.—Dissection of a child's cheek to shew the sucking-cushion (s).

recently drawn attention to this under the name of "*Saugepolster*" (sucking-cushion). It is believed they exercise an important function in the act of sucking, by distributing atmospheric pressure, and preventing the buccinators from being forced between

Fig. 10.—An emaciated child crying, showing large sucking-pads. the alveolar arches when a vacuum is created in the mouth. Whatever their function, it is certain they are relatively larger in

¹³ Dr. F. Churchill, *Path. Soc. Trans.*, vol. xxiii, p. 234; M. Cauchois, *Gaz. des. Hôp.*, July 7th, 1883.

¹⁴ Eve, *Path. Soc. Trans.*, vol. xxxix, p. 295.

¹⁵ *Virchow's Arch.*, Bd. xcvii, 527.

infants than in adults. Ranke also points out that in emaciated children they are only slightly diminished in size, even when there is scarcely any subcutaneous fat on the body.

These pads offer a remarkable contrast to the camel's hump, for this is said to get smaller when it performs long and toilsome journeys. The sucking-pads occasionally enlarge in adults, and M. Paul Berger¹⁶ relates a case admitted into La Charité with a large calculus impacted in Steno's duct. The irritation consequent on this accident caused enlargement of the pad.

PAROSTEAL LIPOMATA.

This term has been applied to fatty tumours arising in connection with periosteum. They constitute an interesting group, as they give rise to great difficulty in diagnosis. Although the published accounts of such tumours are not numerous, yet I believe parosteal lipomata are not rare. Their special features are the following: as a rule they are congenital, and nearly always contain tracts of striped muscle fibre.

A typical specimen is represented in Fig. 11, which grew in

Fig. 11.—A parosteal lipoma attached to the clavicle.¹⁷

connection with the clavicle near the attachment of the sternomastoid muscle of a child. Along the seat of attachment to the periosteum a wide stratum of striped muscle fibre was found. This specimen was presented to the museum of the Middlesex Hospital by Mr. A. Pearce Gould.

Parosteal lipomata have been found attached to the following bones: tibia and fibula, deeply placed between the muscles of the leg—it was noticed when the girl was a year old, and removed when she was 7 by Mr. T. Smith¹⁸—femur¹⁹ (D'Arcy Power); ischium,²⁰ neck of radius,²¹ and coccyx²² (Mr. T. Smith); anterior superior spine of the ilium²³ (Mr. Walsham); clavicle²⁴ (Pearce Gould) (Fig. 11); scapula²⁵ (Mr. T. W. Nunn); frontal bone²⁵ (Sydney Jones).

Dr. Fred. Taylor²⁶ reported a case of fatty tumour growing from the front of the bodies of all the cervical vertebrae; it projected into the pharynx, and bulged on each side of the oesophagus, simulating a postpharyngeal abscess. The patient was a little girl aged 4 years.

In some of these specimens striped muscle tissue was noted, but not in all. In June, 1889, I removed from beneath the occipitofrontalis muscle of a man, aged 30, a lipoma adherent to the pericranium overlying the right frontal eminence. The patient had noticed the tumour as long as he could remember. The centre of this lipoma was occupied by a layer of well-marked, unstriped muscle tissue.

LIPOMATA IN RELATION WITH THE SPINAL CORD AND ITS MEMBRANES.

Fatty tumours are found in connection with the spinal cord under two forms. The most remarkable are those which grow within the dural sheath, and surround the cord. Some of these

¹⁶ *Gaz. des Hôpitaux*, November 15th, 1883.

¹⁷ *Medico-Chir. Trans.*, vol. lxviii, Fatty tumours.

¹⁸ Butlin, *Path. Soc. Trans.*, vol. xxviii, p. 231.

¹⁹ *Loc. cit.*, vol. xxxix, p. 270.

²⁰ *Loc. cit.*, vol. xvii, p. 286.

²¹ *Loc. cit.*, vol. xix, p. 344 (also Holmes Coote, *JOURNAL*, January 1st, 1870).

²² *Loc. cit.*, vol. xxi, p. 334.

²³ *Loc. cit.*, vol. xxxi, p. 310.

²⁴ Catalogue Mus., Middlesex Hospital.

²⁵ *Path. Soc. Trans.*, vol. xxii, p. 243.

²⁶ *Loc. cit.*, vol. xxviii, p. 216.

intradural lipomata are more curious, in that they contain tracts of striped muscle fibre. A specimen of this nature has been placed on record by Gowers.²⁷

Recklinghausen described a fatty tumour in a man lodged within the dural sheath. In this case the cord, instead of ending at the level of the second lumbar vertebra, extended to the middle of the sacrum, and was imbedded in fatty tissue containing striated muscle fibre. Recklinghausen remarked that the muscle resembled the short fasciculi of the special muscles of the spine. Each fasciculus was a muscle in miniature, and had terminal tendons. The man was the subject of spina bifida occulta in the lumbo-sacral region.

Obré²⁸ described a specimen found in the spinal canal at the level of the seventh clavicle and first dorsal nerve.

The occurrence of an intradural lipoma is not surprising, for the loose connective tissue between the cord and the dura mater is in many mammals, especially in young lions, bears, and tigers, occupied by fat often in large quantity.

Many congenital tumours have been described as lipomata which have occurred in connection with the spine, and in a few instances where surgeons have been rash enough to meddle, the tumours have been found to pass deeply, and to be connected with the dura. In the majority of instances these were examples of spina bifida in which the sac had become surrounded by an unusual quantity of fat.

In this account of fatty tumours I have intentionally avoided considering those which arise from fatty changes in nævi.

FOUR YEARS' EXPERIENCE OF CASES OF STRICTURE OF THE URETHRA TREATED BY ELECTROLYSIS, WITH A RECORD OF FIFTY CASES.¹

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It is more than four years since Dr. Steavenson and I first published a note in the JOURNAL on the treatment of strictures of the urethra by electrolysis. This was supplemented by our paper before the British Medical Association a year later, and also by a contribution of my own in the *Practitioner* of the same year. The plan of treatment laid down in these papers by Dr. Steavenson and myself has been in the main adhered to, being modified only in a few details.

The cases referred to in the following paper comprise those which were recorded in my paper in the *Practitioner*, as well as others which have since come under my care. I am anxious to take the present opportunity of tendering my best thanks to Dr. Steavenson and his various assistants in the electrical department at St. Bartholomew's for the help I have so often received at their hands.

During the past four years I have had special opportunities of testing this method of treatment, and propose in the ensuing paper to give some accounts of what results may be expected from it, and I am the more induced to do so because I have received a large number of letters from others who are interested in the same subject, and who have requested me to furnish them with some details of the management of these cases.

In addition to this, a large amount of correspondence has taken place in the various medical papers, particularly during the past year, tending to throw a certain amount of discredit upon this method of treatment. I am, however, convinced that anyone who takes up the subject, if he will, before doing so, master the details of the electrical apparatus which he proposes to employ, and if he will carefully attend to his battery and to the other instruments which he employs, will not be disappointed by the result which he obtains; nay, more than that; the success which will attend his efforts will be quite as great as that which will attend treatment of nævi by this method, or in any other of the various conditions for which electricity has been so largely employed in recent years.

In addition to discussing the best method of carrying out elec-

trollysis, I am anxious in this paper to give as far as it lies in my power the subsequent history of fifty cases of stricture of the urethra treated by this method, with the results, temporary and permanent, which this plan has yielded. With regard to the question of permanency, I am quite aware that it may be urged that even four years is not a sufficient length of time to enable one to ascertain with accuracy what the ultimate result may prove to be; but a somewhat extended experience of these cases leads me confidently to assert that, though four years' immunity from urinary trouble may not be an absolute safeguard against relapse in all cases, yet in the great majority of instances such a period of freedom from symptoms may be regarded as practically constituting a cure.

Before passing on to consider more in detail the various modifications of the electrolysis treatment which I have adopted or the various kinds of stricture to which this kind of treatment is applicable, I will give a brief summary of the changes in the urethra which can be produced by this plan of treatment. As I stated in the account which I gave both in the JOURNAL and also in the *Practitioner* between three and four years ago, an employment of a galvanic current to effect changes in the normal and diseased parts of the body is no new idea, nor is its application in some form or other to the treatment of urethral stricture by any means a recent innovation. Mallez and Tripiér gave a full account of their attempts in this direction in the *Comptes Rendus*. Apparently, from their description they failed to distinguish between the galvano-caustic and electrolytic action of the current which they were employing. The reintroduction of this plan of treatment is largely owing to Newman in America, though my experience does not by any means dispose me to agree with him in all particulars, yet it is only due to him to state that he was, as far as I can learn, the first distinctly to point out that the change to be effected in the tissues must be one of gradual alteration (electrolytic action), and that the tissues must not be destroyed wholesale by the galvano-cautery.

Caustics had been employed early in this century by Sir Everard Home, and he gives in his writings a most graphic account of his success in at length passing a stricture, after some hundreds of sittings. Sir Henry Thompson has alluded to this subject in his account of stricture, and that plan needs only now to be mentioned to be universally condemned.

The method which is now known by the name of electrolysis is as essentially different in its results from those which are produced by the galvano-cautery as from the treatment point of view to be in no sense comparable with it and when the weaker electrolytic currents are employed, the changes which are effected in the tissues by them are of so slight a nature, and give rise to such an entire absence of anything like destruction, that they cannot in reality be compared to a destructive process. Every one has observed the changes that go on in a recent scar, after it has been skinned over, how the tissue undergoes alteration, and eventually the firm, hard cicatrix, with which we are so well acquainted, is the result. That which is effected by electrolysis is really an action upon the tissues, promoting and softening of this cicatricial tissue, and to be efficient must be very gradually and carefully produced. And this is no mere theory, for we have frequent opportunities of witnessing what takes place in those tissues which are submitted to electrolysis, and which are at the same time under the observation of the naked eye. It seems as if the action of a current through the tissues gave rise to increased activity in them and thus produced, in many instances, a rapidity of tissue change which could not under ordinary circumstances be effected without some considerable lapse of time, and in many instances would not have taken place at all. Thus, for example, I have on more than one occasion witnessed the effect of galvanism on two legs which were the seat of a considerable amount of oedema, the result of plugging of the veins. If the one be galvanised, the positive pole being placed over the region of the sacrum and the negative over the affected part, the leg which is so treated will recover its normal condition some time sooner than the one which is left to Nature; and, to effect this purpose, the same battery, almost the same electrodes, the same galvanometer and almost the same current strength may be employed, as if it were the urethra we were operating on. Use the same battery and the same instruments, replacing electrodes which were used in the previous case by sharp pointed needles, and we can effect such change upon nævoid tissue as will promote a healthy action in the parts, coagulate the blood in the blood vessels, and convert the vascular into fibrous tissue.

²⁷ Loc. cit., vol. xvii, p. 19.

²⁸ Path. Soc. Trans., vol. iii, p. 248.

¹ Read before the Medical Society of London.