

BALTIMORE.

Johns Hopkins Hospital.—Hot-water heating; gravity system. Indirect in wards; direct in corridors and offices. Ventilation by aspirating shafts.

PHILADELPHIA.

Medico-Chirurgical Hospital.—Hospital wards and clinical amphitheater heated by motor-driven fan through indirect steam coils. Offices, corridors, etc., direct steam.

Hahnemann Hospital.—Direct steam heat; indirect in new amphitheater. No fan.

Pennsylvania Hospital.—Central building heated by hot-blast fan system; wards, indirect steam without fan; corridors, etc., direct steam.

University of Pennsylvania.—Laboratories (new), corridors, offices, etc., direct steam. Laboratories, operating room, etc., have hot-blast fans and education fans; latter not in use. Medical department, direct steam.

New Municipal Hospital for Contagious Diseases.—Indirect steam from central plant. No fans.

NEW YORK.

Presbyterian Hospital.—Heated with indirect steam coils operated by fan. The superintendent, Dr. Fisher, does not approve of system.

Mt. Sinai Hospital.—Equipped with hot-blast system and education fans on roof. Also direct steam heaters under all windows in wards and corridors. Fan system not used. When visited by committee ventilation was effected by opening the windows.

Lying-in Hospital.—Fan system—one set to blow in and one set to draw out. Also some direct radiation in each room. Blowing fans not used. Education fans only in use. This saves \$3,000 per year.

New York Hospital.—Fan system, blowing tempered air through indirect coils. In use all the time.

St. Luke's Hospital.—Heating, direct steam. Exhaust fans used for ventilation; in use part of the time.

BOSTON.

Massachusetts General Hospital.—Old buildings, indirect steam; no fans. New buildings, double fan system, one to blow in and one to draw out; both in use.

Boston City Hospital.—A mixed system; partly direct steam and partly indirect steam, with aspirating coils. Surgical building, fan system.

BUFFALO.

General Hospital.—Hot-blast fan system; objected to; hard to work. No thermostatic control. No exhaust fans. Ventilating flues through roof.

CLEVELAND.

Lakeside Hospital.—Fan system through individual stacks. Bottom heat inlets (a mistake). Bottom vents carried down through basement to hot stack.

Original Articles

FIBROID GROWTHS OF THE ABDOMINAL WALL.*

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DENVER.

The comparative rarity of these so-called desmoid tumors may be seen by referring to very recent statistics gathered by Cabot¹ of Boston, who found but 3 of this nature in a series of 4,876 abdominal tumors encountered at the Massachusetts General Hospital. Ledderhose in 1890 was at some pains to collect 100 cases. More recently, Pfeiffer² cites 40 cases seen in the Tübingen clinic during the past 46 years, and adds to this 360 other cases which he gathered from literature.

* Read in the Section on Surgery and Anatomy of the American Medical Association, at the Fifty-sixth Annual Session, July, 1905.

1. Trans. Assoc. of Amer. Physicians, 1905.

2. *Beit. z. klin. Chir.*, 1904, vol. xlv, p. 334.

The term desmoid, by which these growths have generally been described, originated with Johannes Müller in 1838, and was intended to designate tumors of the musculo-aponeurotic tissues of the abdominal wall (tendon-like neoplasms). My own attention was directed to these rather curious growths by three cases seen, respectively, at the New York Cancer Hospital, St. Luke's Hospital in New York and at the City and County Hospital in Denver. These cases were practically duplicates. Each occurred in a young woman between 25 and 35 years of age who had recently gone through pregnancy. In each the growth was in the region of the right rectus muscle and near the level of the umbilicus. In two the peritoneum was involved and required excision; in the other the peritoneal cavity was not opened. In one the size of the growth is described in my notes as "about the size of a pullet's egg;" in one it was the size of a small orange; in the other, that of a little baby's fist. In each of the three cases the hospital pathologist reported the growth to be a fibroid. Each patient made a prompt operative recovery. In two cases the fate of the patient after leaving the hospital is unknown to me. In the third, a patient operated on in the City and County Hospital in Denver in June, 1904, there has been no relapse as yet.

I have made but brief mention of my own cases, but on examining the literature of the subject I am struck by the fact that most of these growths occur in practically the same way.³

Pfeiffer analyzed 400 cases, and his observations are so valuable that I shall quote from them at length and without apology.

No cases are included in the category except those which really began in the muscles and aponeuroses. This excludes tumors beginning in the round ligaments, in the periosteum of the ribs, pelvic bones and vertebrae, and in the ligamentum teres, all of which may present themselves as tumors of the abdominal wall despite their peduncular attachment to the outlying tissues.

Desmoids, unlike sarcomata in the same situation, occur in the great majority of cases in women—the ratio being about 7 to 1.

In regard to the influence of previous pregnancy, Pfeiffer has data in 265 cases, and of this number 250 women, 94.3 per cent., had borne children—usually more than one. The tumor appeared, as a rule, immediately after delivery, and in only 15 is it expressly stated that the woman was pregnant when the growth appeared. Naturally, a majority of women were of child-bearing age; 146 were between 25 and 35. 41 were between 15 and 25, and 35 between 35 and 50. Only 15 women were over 50. In a considerable number the age was not given. A very few women were over 60. Of the few men observed, the common age was between 35 and 50. There are also a few cases recorded in children; some of these were undoubtedly congenital.

Heredity may be disregarded as a causal factor, and the very great majority of the growths were single.

3. The following are among those who have recently paid attention to the subject: Venot: *Jour. de Méd. de Bordeaux*, 1903, xxxiii, 417. Abadie: *Montpell. Méd.*, 1903, xvii, 97. Bornemann: *Hosp. Tidende*, 1903, xi, 759. Sabadini: *Bull. Méd. de L'Algérie*, 1903, i, 261. Schlokouski: *Beit. z. Lehre, von Bauchdeckenfibrom.* Diss. Berlin, 1903. Druebert: *Echo Méd. du Nord*, 1903, vii, 512. Silberberg: *Bull. et Mem. Soc. Anat. de Paris*, 1903, lxxviii, 677. Fedet: *Ibid.*, 712. Havemann: *Ueber Tumoren der Bauchdecken.* Diss. Halle a. Lax, 1903. Larass: *Ueber Desmoide der Bauchdecken.* Diss. Leipzig, 1904. Eitel: *Northwest Lancet*, 1904, xxiv, 228. Stein: *Monats. f. Geburts. u. Gyn.*, 1904, xix, 360, and Pfeiffer.

Location.—In 185, or 72.5 per cent. of available cases, the growths were below the navel; of these 37.2 per cent. were to the right side, 27 per cent. to the left, and 8.2 per cent. in the middle line (absolute ratio, 51 per cent., 37 per cent. and 12 per cent.).

In that part of the abdominal wall above the umbilicus desmoids occurred much less frequently, in all 41, or 16.1 per cent; 17 on right side, 20 on the left side and 4 in the middle line (ratio, 41 per cent., 49 per cent. and 10 per cent.).

Of the total number 26, or 10.2 per cent., were neither above nor below the navel, but on a level with it—10 to the left and 16 to the right.

Finally, there were 3 in the region of the loins—2 on the right, 1 on the left.

Summary		R.	L.	M.
Above navel	41	17	20	4
Even with navel	26	10	16	0
Below navel	185	95	69	21
Lumbar	3	2	1	0
	255	124	106	25

The point of origin may be a more or less broad pedicle attached to fascia or muscle. Of 268 cases in 115, 43 per cent., the origin was from the rectus muscle. In 13 cases from the anterior and in 34 from the posterior lamina of the fascia, while in the remaining 68 the point of origin is not stated. In 47 cases, 17.5 per cent, the oblique muscles were the origin, in the following order of frequency: Internal oblique, external oblique and transversalis. In 45 cases, 17 per cent., the origin was the abdominal fascia; 10 times from the superficial and 35 times from the deep. In 29 cases the tumor arose from two muscles, and in 29 others so many muscles were involved that the origin could not be determined.

The fact that most of the desmoids arise from the rectus corresponds to their lateral location, and to other points in their localization, such as predominance in the right pubic region.

In form the tumor is usually roundish or rather ovoid. As a rule the long axis of the mass corresponds to that of the course of the muscles and tendons from which it arises. The direction of the growth is usually determined by the resistance encountered. Hence, in primiparæ and in nulliparæ the firmness of the abdominal wall anteriorly prevails over that in the rear. In such cases—relatively few—the tumor grows inward, and has a spheroidal or mushroom shape. When the walls have become lax from child-bearing, however, the tumor grows toward the surface, even when it arises from the posterior sheath of the rectus; showing that the resistance from behind (transversalis fascia, peritoneum and intestines) exceeds that of the abdominal wall in front. The least resistance encountered is in the muscles themselves in their long direction, this favoring the flattened or ovoid shape. When a tendon or muscle sheath is encountered a constriction results and the tumor grows above and below it, producing the so-called cuff-button form. Multiple constriction produces lobular forms, which may simulate multiple tumors.

While the attachment is usually broad, so that the mass lies in its bed like a disc, slender pedicles may occur. Frequently extirpation may be accomplished by shelling the tumor out of its bed. A capsule is usually present, but this becomes atrophic from pressure. It is not involved in the growth of the tumor in the majority of cases, but often when the growth exhibits sarcomatous tendencies a diffuse union of the tumor with

the surrounding tissues is found, and extirpation can be effected only by the knife and scissors.

In many cases (especially in those reported from French sources), a connection is mentioned as existing between the desmoid and some osseous structure (false ribs, ilium, pubic bone). This is termed the bone pedicle. Although their existence has been denied, there is good evidence that such secondary bone pedicles sometimes do occur. Olshausen, who has seen such cases, believes that these pedicles may be primary. Such a view would confound desmoids with true tumors which originate from periosteum. In Pfeiffer's 400 cases, no less than 65 (16.25 per cent.) had osseous attachments, 35 with ilium, 8 with pubic bone, 6 with false ribs and 1 with spine. In two cases there was attachment to two bones—ilium and os pubis.

The rate of growth and size of the tumor vary extremely; in many cases several years, even several decades, may show hardly any change; then a sudden and rapid growth may set in. In other cases, the growth may be rapid at first, but when a certain limit has been reached (size of head) the growth may remain stationary for years. Rapid growth does not necessarily mean malignancy. Sometimes tumors are seen which prove fatal when their growth has been slow throughout. One patient who refused operation died in 18 months.

The usual size of a desmoid is from that of a hen's egg to that of a large fist. It is not rare to see them as large as a child's or adult's head. They may attain a weight of 2 or 3 kilos. Very exceptionally great weights have been recorded—up to 10 kilos. Some of the oldest reported cases had weights of 17 kilos, 22 kilos, etc. This may be explained by the fact that these tumors cause relatively little trouble, and hence may have been allowed to grow indefinitely before medical advice was sought.

It has very often been noted that the desmoids were first noted during pregnancy (including puerperium) or else began to grow rapidly at that time, to become stationary again after the childbirth was over. This happened in 99 out of 400 cases (about 25 per cent.) Growths extirpated during pregnancy may recur during a subsequent gestation.

In nulliparæ and in males, trauma is frequently accused as a cause (about 7 per cent. of the entire number).

Pathologically these desmoids are firm, hard masses, usually enveloped in a membrane. They creak when cut, the section being pale-red or whitish-yellow and tendon-like. The presence of escaped and altered blood may color the tumor a brownish hue. The texture, in general, is uniformly hard and firm—bundles of fibers may be seen in a network or sometimes in concentric grouping, dividing the area into nodes. The desmoid is poor in vessels, and hence areas of softening may occur. The edema which precedes it may be of such degree as to simulate fluctuation. These areas of softening often lead to the formation of cysts, and these are sometimes hemorrhagic.

Microscopy shows the bundles of fibers already mentioned closely adherent to the adventitia of the vessels. Where edema occurs, the bundles are pushed apart. More or less proliferating tissue is present—as shown by young connective-tissue corpuscles in the course of transformation into fibrillæ. When this immature tissue is especially abundant and collected into clusters the tissue of a sarcoma, round or spindle cell, may be simulated. This may lead to mistaken diagnosis when

a piece of tumor is excised before operation. Some cases thus diagnosed as sarcoma have not relapsed even when extirpation was incomplete; other cases diagnosed as desmoid have rapidly recurred (the latter mistake is much more infrequent). A microscopic diagnosis in advance of operation can not be made with certainty and does not give any guide to prognosis as to recurrence. The amount of formative tissue present is likewise no criterion of benignancy or malignancy.

The "more or less cellular fibroma" is the most common type of the desmoid, especially in women. Pure sarcoma (round or spindle cell, and oftener the latter) also occurs, especially in men. Other types of sarcoma are rare or absent, save cysto-sarcoma. (It seems to me that all sarcomata should be excluded from this class.) As far as the material is available, 88.2 per cent. of all cases in women were cellular fibromata and 11.8 per cent. sarcomata; in men the two percentages were 75.6 and 24.4.

In only 14 cases, 4.67 per cent., was there a mixture of myxomatous tissue. There was a single case of pure myxoma and no instance of myxosarcoma. Calcification occurred in 4 cases. A doubtful case of suppuration of a desmoid is recorded.

Several authors record the presence of smooth muscle (fibromyoma). Of a number of alleged cases Pfeiffer selects some 5 as genuine. Others may be added, but description is not sufficiently thorough. All cases, real or alleged, are in women, but by no means confined to the round ligament region.

Under etiology some points have already been mentioned. Grätzer has elaborated an embryonal theory (confusion of mesodermic elements, both peritoneum and fibrotendinous portions of the abdominal wall being derived from that layer). Herzog has formulated a traumatic theory, based on the possibility of injury to the rectus muscle, formation of organized hematoma (muscle callus) and eventual tumor formation. This view has been well supported in literature, but can not be made to apply to other muscles when injured.

Sänger has apparently refuted both the preceding theories. Simple homologous tumors do not have an embryonal origin, while desmoids show no evidence of hematomatous origin.

Guinard and other French authors seek to connect all desmoids with the round ligament, as far as women are concerned. Cases in men are placed with sarcomata. This view is opposed by facts already cited.

As far as trauma to muscle is connected with pregnancy, etc., obstetricians are almost universally silent as to such injuries, hematomata, etc. The exception is Stoeckel, who has reported 2 cases of hematoma of the abdominal wall in pregnancy. Not only could he find no other cases in literature, but both his own occurred under peculiar circumstances, viz., severe paroxysms of coughing and with a general hemorrhagic diathesis.

Numerous cases of hematoma of the abdominal wall from trauma have been recorded in man, but none was ever known to cause a desmoid, unless we include certain cases of keloid, which present some resemblance. If desmoids arise from trauma they should be much more common in men. Certain lesions—indurations, hematomata, cysts, keloid—have been known to follow injury to the muscular region, but they follow closely on the latter. Desmoids, on the other hand, differ greatly from such sequelæ.

Ribbert's theory of tumors may be applied to desmoids. This is a modification or expansion of the old

Cohnheim theory as applied by Grätzer. As applied by Lücke, it depends on the plasticity and distention of the abdominal wall as a result of pressure of the gravid uterus, thus favoring the proliferation of connective tissue elements by reason of diminished resistance—the best answer to this view is that we do not see desmoids follow distention from ovarian tumors and the like, while the sexual organs proper undergo a degree of softening which might favor proliferation of elements previously held in check. This feature of pregnancy can not be applied to the abdominal walls.

Wischnewsky has recently made exhaustive studies of the distended abdominal wall. He states that in pathologic conditions the muscles atrophy, while in pregnancy they undergo hypertrophy in which the fibrous tissues participate. Durante has made the same observation.

This fact enables us to exclude distention as an efficient cause. The connection of desmoids with pregnancy can not be explained in this way. With a normal hypertrophy of the fibrous structures occurring at this period, the presence of young connective tissue at once suggests a possible factor in the causation of these tumors. The coincident distention and stretching of the abdominal wall could then be invoked as a secondary factor. To produce a truly pathologic state it would still be necessary to call on the misplaced germinal matter dating from the embryonal period.

These three factors, viz., diverted or superfluous embryonal elements, a state of active proliferation of normal fibrous tissue and a stretching or loosening of the parts involved, only apply to pregnancy. In trauma there is not the stretching, but there is an edematous succulence which may produce an analogous result. Individual cases of desmoid following laparotomy scars, the pressure of a belt buckle for a long period, etc., could also be thus explained. A single blow, laceration, etc., may be and often have been alleged as causes. But the formation of a hematoma is not a necessary step.

In regard to symptoms, subjective disturbances are usually absent at first, and women seek operation for cosmetic reasons only.

When the growth reaches the size of an English walnut, pain may appear in various types, local or radiating, worse during the menses or present only at that time. In very nervous women, the presence of the pain may cause great discomfort; rarely convulsions or hallucinations, which disappear with extirpation. When the tumor grows rapidly, attaining a considerable size, patients complain of peculiar painful sensations, due perhaps to compression of nerves or to stretching of skin. Medical aid may now be sought and an erroneous diagnosis of malignancy may be made. Pressure symptoms are usually absent, as is also distress from external contact. Tenderness to pressure is usually absent as well. The skin may or may not be stretched and glossy; with large tumors *striae atrophicæ* appear. Adhesion with the skin if of rare occurrence; when present it causes redness and edema and even ulceration, phlegmon and sepsis. The most cellular type of fibroma, with relapse of same, almost never involves the lymphatics.

Diagnosis is by no means so easy as might appear. When small and not adherent beneath, diagnosis is easy; no so when opposite conditions exist. Characteristic is the readily mapped out limits, the conformity in direction with the muscles, the degree of mobility—these may be made without narcosis. These desmoids of the rectus are naturally movable from side to side chiefly. Bouchacourt's symptom is of value—the patient sets her ab-

dominal muscles in voluntary contraction by rising from a chair without aid of the arms; during this contraction all mobility of the tumor disappears. If the tumor then becomes more prominent, it is probably derived from the superficial muscular layers; if it becomes less prominent, its origin is from the deeper layers. This maneuver may not succeed if the abdominal wall is either unduly firm or unduly lax. As compared with abdominal tumors of deeper seat, the parietal kind do not change their position with change of posture. Bulging outward is very characteristic of desmoids, this being much more marked than mere palpation would seem to indicate. Unless deep adhesions have formed there is no change of position during respiration.

Diagnosis, however, is often not only difficult, but apparently impossible. A large number of mistakes are on record in which desmoids have been confounded with other conditions—various cysts, tumors of the gall bladder, omental tumors, salpingitis, appendicitis and other intra-abdominal affections. Hence the necessity of differential diagnosis between desmoids and a host of other intra-abdominal conditions. Exploratory incision and exploratory laparotomy may be necessary. Narcosis will exclude hysterical tumors. Vaginal and rectal exploration may be of aid.

Treatment is purely surgical, and the desmoid should be extirpated at once. The surgeon must beware of too radical intervention, as the operation may leave a breach in the abdominal wall which can not be repaired. In pregnancy, extirpation is indicated in the early months, but in the later months operation must be deferred until after delivery; otherwise the operation scar would be likely to rupture. Some authors, however, do not advise waiting.

As even the smallest desmoids, when they arise from the posterior aspect of the rectus, may necessitate a peritoneal resection, such a contingency must be prepared for.

In operating, the incision must be in the direction of the long axis of the tumor. The skin and muscular layers are first divided. If the tumor is encapsulated, not adherent and sharply outlined, it may be removed by blunt dissection. If at any point it appears to have involved the investing tissues, free excision must be made. It is of no use to attempt a blunt separation of the peritoneum, and one should not hesitate to open the abdominal cavity. General narcosis must be employed. Successful cases of imperfect removal must not be allowed to influence the surgeon, for these are rare exceptions. Even when the desmoid can be removed extra-peritoneally, it is sometimes wise to resect the peritoneum in order to prevent infection by facilitating drainage. Cases of peritonitis have been reported in which that membrane was not involved in the operation. Under such circumstances two cases have terminated fatally.

Resection of the peritoneum and extirpation of the tumor adherent thereto is, in general, best done as follows: At the edge of the tumor a small incision is made through the membrane and the tumor is excised. Snger, who lost a case by hemorrhage into the peritoneum, proposed the use of "arcade ligatures" about the tumor which was to be excised.

If such large areas of peritoneum must be removed that the breach can not be closed by primary union, the wound must be made as small as possible by suture, after which the edges are to be stitched to the omentum.

Postoperative hernia is best prevented by separate

suture of each plane. If necessary, the opposite muscles may be used for plastic purposes.

If the entire half of the abdominal wall is involved, the skin should be spared in the excision of the tumor; it may be of value in closing the breach if muscle plastic is available. If the flaps left in certain cases are redundant, Knig's plan may be followed; that is, the skin may be arranged in cock's-comb fashion and the subcutaneous tissues sutured together.

If suture in individual planes has been effected, there is no need of a retentive band. Under other circumstances a bandage must be worn for several weeks after complete healing of the wound.

The immediate results of operations on desmoids of the abdominal wall have been relatively favorable since the introduction of asepsis. Discarding some of the older material Pfeiffer has notes of 285 patients operated on. Of this number the abdominal cavity was opened in 119, 40.8 per cent. The primary mortality in these cases was 10 cases, 3.5 per cent. In 142 cases, 49.8 per cent., extirpation was effected without opening the peritoneum. The mortality here was 3 cases, 1.05 per cent. In 24 cases details as to peritoneum fail. The combined mortality was 4.55 per cent. Of the 13 cases, 7 patients died of collapse or secondary hemorrhage and 6 of peritonitis.

In regard to ultimate results Pfeiffer avails himself of 107 cases, 85 females and 22 males. Relapse occurred in 33, 39.8 per cent.—15 males, 18 females. In 17 cases, relapse was fatal—11 males, 6 females. Hence, relapse occurred in males in 68.1 per cent. and was fatal in 50 per cent. Relapse occurred in females in 21.2 per cent., mortality but 7 per cent.

Late relapse occurred at varying intervals. In no case did it occur in the first 3 years among the women (40 cases studied), but 2 men had relapsed (out of 5 studied) within that period. In the cases of late recurrence studied in women, 3 in all, the interval after operation was 4, 7 and 9 years, respectively. In the 2 cases of early relapse in men, there was a history of repeated relapse; in one the interval was brief, in the other 14 years.

It is but natural to assume that the smaller the growth at the time of extirpation the less will be the liability to recurrence.

DISCUSSION.

DR. ROBERT F. WEIR, New York, said that this is a rather rare affection, but he has met with it twice and both cases were in young unmarried women between the ages of 30 and 35. The first tumor he thought was an ovarian tumor with very solid contents. He made an incision which revealed the fact that it was not in the abdominal cavity. The adjacent tissues peeled off readily and the mass weighed fourteen pounds. The attachment was along the line of the right linear semilunaris. The patient recovered with a fair condition of the abdominal wall and remained well for several years when she passed from his observation. The younger patient had a little different tumor in the lower right side. It was removed by incision; the attachment was in a similar situation, but it demanded some sacrifice of muscular tissue. Under the microscope it was pronounced to be purely fibrous, but it recurred eight months afterward, when after removal it was pronounced to be a spindle-celled sarcoma. If it had been carefully examined all over by the pathologist it would probably have shown in some parts of the eight pounds that it was a spindle-cell sarcoma. It recurred again, and was again removed when it had recurred, but he refused to do anything further surgically. She was treated by erysipelas toxins by an expert, under which treatment she improved to some extent, but eventually she returned to the hospital and died

from the tumor. This case shows that these large masses are at times malignant. In the second procedure help was derived by liberating the peritoneum from the adjacent extraperitoneal tissues. In this way adhesions were avoided.

DR. EMMET RIXFORD, San Francisco, mentioned a similar case occurring in a young woman of 27 who had been pregnant some time before the tumor was discovered. The tumor grew slowly but continuously and when operated on it measured 4x8 inches. It was somewhat the shape of a modern football, was smooth in outline and situated in the anterior abdominal wall at the outer edge of the left rectus muscle. The operation was simple. The growth, which was situated in the internal oblique muscle, was simply shelled out. The peritoneum was not opened. The muscles were drawn together with chromicized cat-gut and wound closed. Although the operation was done some ten years ago and the patient has since been through two childbirths there has been no recurrence of the tumor and no hernia. The tumor was diagnosed as sarcoma but it was definitely a desmoid, although the pathologist was unable positively to exclude malignancy because some of the areas in the tumor were evidently sarcomatous while other areas were apparently of simple fibrous tissue.

DR. ALEXIUS A. MCGLANNON, Baltimore, stated that recently he had a similar tumor for three years. After operation the patient was free from the growth for fifteen months and then it recurred and was again removed. The first tumor was a soft fibroma, while the second showed all the varieties of malignant connective tissue tumors. It was lobulated, some lobules showing fibro-spindle-cells sarcoma, and some mixed spindle and round cells. The second operation was only done in May, so that Dr. McGlannon does not know the results. The fact that the tumor became more prominent after contraction of the abdominal muscles was considered important, indicating a superficial position; but the tumor involved the entire thickness of the wall from subcutaneous fascia to peritoneum, and became prominent when the muscles were contracted because of intra-abdominal pressure.

DR. J. P. CONNELL, Fond du Lac, Wisconsin, reported two cases, one of which was a tumor of the rectus muscle, the size of an egg, which has not recurred. The second case occurred six months ago, and the tumor extended from the erector spinæ almost around to the ribs. He took a section of the growth and the pathologist reported a fibroma; he then advised removal. He dissected the growth out from the rectus muscle, a great deal of which was involved, as were several other abdominal muscles. The attachment extended to the periosteum of the ribs and in operation he removed a section of several of them. The patient made a good recovery. In his dissection he made a large flap and after turning out the growth stitched the flap back into place.

DR. O. O. WITHERBEE, Los Angeles, reported a case involving the left rectus muscle following an operation for salpingitis. The microscope gave a spindle-cell appearance but not exactly of the sarcomatous type. To have removed it would have left the patient without any abdominal wall, and he therefore advised using the Coley fluid. The patient had been reduced in weight to 85 pounds when beginning the serum, so that the prognosis was most unfavorable. He used the serum under protest, but it looked like a last resort. At first it was used every other day, in sufficient quantity to produce a reaction; in a few weeks it was used every third day, and later every fourth day, until after six months it was used only once a week. The patient now weighs 120 pounds, and there is only just a suspicion of the tumor left.

DR. JACOB A. FULTON, Astoria, reported a case of fibroid tumor of the abdominal wall on which he operated 16 years ago. At that time he considered it a rare disease for he found few reported cases. In its removal a portion of the peritoneum about the size of a dollar was removed and although the patient had secretly eaten a large number of dried prunes before the operation, and vomited prunes in large quantities, the operation was successful and no hernia followed. There has been no return of the disease.

DR. L. L. MCARTHUR, Chicago, mentioned one case of this type which well illustrates the difficulties of diagnosis. The

growth was so mobile that it was transferred from the gynecologic to the surgical department of the hospital. On opening the abdomen Dr. McArthur found a tumor with a broad, flat ribbon-like base extending from nearly the umbilicus to the symphysis. He thought that he had to deal with a long pedunculated uterine fibroid. The interne, in his bi-manual manipulation, had been able to detect that when the tumor was pushed down the abdominal wall was also dragged down, especially under the right rectus.

DR. MAURICE H. RICHARDSON, Boston, stated that Dr. Wiloughby's reference to Coley's treatment brought to his mind an inoperable case of fibrosarcoma of the abdominal wall so successfully treated that a hernia developed in the scar of exploration through a space occupied originally by six or eight inches of dense tumor. Dr. Richardson has seen several cases of fibroid tumors of the abdominal wall. Whether they were of the desmoid variety or not, he cannot say. The practical point in the treatment of any neoplasm extensively involving the abdominal wall is the closure of the gap left by its removal. He has recently succeeded in filling in the gap left after removing the muscles of the left lower quadrant, which, with a portion of the os pubis, had been involved in the fibrosarcoma of great extent. The muscular belly of the tensor vaginæ femoris, with the fascia lata, was reflected from the thigh and sutured to the edges of the gap, as shown by these blackboard drawings. A firm and serviceable abdominal wall has resulted.

DR. CHARLES A. POWERS stated that it is difficult to distinguish between certain types of fibromata and sarcomata, and that the best that can be done is to get a reliable pathologist's report on the tumor. Dr. Powers stated that his paper dealt only with fibromata. In referring to Dr. Richardson's case Dr. Powers quoted Dr. Jacobi of New York who reported a case of extremely high temperature which he had observed; a number of men disputed the accuracy of his observation whereon Dr. Jacobi said that when the clinical facts collide with previously existing scientific knowledge the latter goes to the wall and the facts stand. Dr. Powers said that he is quite ready to accept Dr. Richardson's conclusions.

CYSTS OF THE SPLEEN.*

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Splenic cysts, unaccompanied by cystic formation in other structures, do not often occur. The classes found are: 1, Dermoid cysts, one of this type being reported by Andral; 2, simple, serous, or blood cysts, of which a few cases have been reported; 3, echinococcus cysts. Although the latter usually occur in association with similar cysts in other organs, there are reported, according to Coen, as quoted by Douglas, 61 cases of solitary splenic cysts, although the spleen is involved in only from 1 to 3 per cent. of human echinococcus.

The etiology of cysts of the spleen in the case of dermoids and echinococcus may be summarily dismissed with the statement that it is the same as in other structures. Simple serous or blood cysts are of more interest. They are called by the last name of the three by certain authors from the fact that they are all thought to occur from an extravasation of blood within the organ or its capsule, the sanious contents remaining indefinitely or being replaced by a fluid, sometimes clear, sometimes straw-colored. Others, however, attribute the serous and the blood cysts to different causes. Andral reported a case of simple serous cyst in the center of the spleen, and Leudet a multilocular cyst in a spleen that was not enlarged. Boettcher found a multiple serous cyst in an amyloid spleen and noted that some of the

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