is the fact that oxygen is far more generally used now than it used to be. Formerly a cylinder stood in a remote corner, and was only resorted to, somewhat shamefacedly, when the patient was either blue or moribund. Now it stands at the anaesthetist's elbow and is in constant use, either in a gas and oxygen machine or as the motive power for a Shipway or in connexion with an ordinary closed or open method. This appears to fit in historically, but it is purely speculative. It is put forward because all the other theories appear to be faulty on examination.

Conclusion.

In view of the lack of real knowledge it would be an excellent plan if all cases, fatal or not, were notifiable and underwent a full investigation on the lines suggested by the above theories. The condition is so rare that individuals cannot solve the problem. I regret that the oxygen used in my own case was not examined, but the possibility of this being at fault only occurred to me after collecting, examining, and rejecting the published explanations. It would be worth while investigating this point in any future cases.

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SPONTANEOUS HAEMATOMA OF THE RECTUS ABDOMINIS MUSCLE.

WITH A REPORT OF TWO CASES.

BY

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RECORDED cases of spontaneous haematoma of the rectus abdominis muscle are not very numerous, although it would appear from reports of discussions on the subject that the condition is seen more frequently in clinical practice than is generally supposed. It has seemed worth while to record the present two cases, which occurred in close succession in hospital, as they appear to throw a little light on the etiology and diagnosis of the lesion.

In England Fothergill⁴ and Andrews¹ have described similar cases, but the most extensive series of cases are those collected by Wohlgenuth, Perman,⁷ and Culbertson.³ These three writers have reviewed all the varieties of haematoma occurring within the rectus sheath, not confining themselves to the spontaneous group. In a more recent paper Halperin⁶ further discusses this last group, and describes another instance of the condition.

It is generally agreed that haematomas of the rectus muscle may be divided into three groups. In the first group are such haematomas as occur during violent effort, usually in athletes, where the haemorrhage is secondary to a partial or complete rupture of the muscle. In the second group may be placed the haematomas met with in the course of infections, such as typhoid fever or influenza; they were a feature, according to Cole,² of the influenza epidemic of 1917. In such cases there is manifestly a local lesion of the muscle preceding the haematoma. To this group also belong those well-defined cases which occur in pregnancy, labour, or the puerperium. The third group of haematomas, of apparently spontaneous origin, and of which the present two cases are examples, has special points of interest. The etiology is obscure, and the clinical picture gains importance from its similarity to that of an "acute abdomen."

CASE I.

A man, aged 63, was admitted to hospital with a provisional diagnosis of some form of intestinal obstruction. He gave a history of having suffered from chronic bronchitis for many years; he had, in addition, been troubled with excessive bleeding after minor cuts and teeth extractions since childhood. He had, indeed, been regarded by his relatives as a "bleeder." During a fit of

coughing he experienced a sharp intense pain in the left lower abdomen. The pain remained severe for a few hours, during which time he vomited repeatedly; it then subsided to a persistent dull ache. He was sent to hospital on the third day of the illness.

An ill-defined, non-tender swelling was found in the abdominal wall, corresponding in position to the left rectus sheath; it extended upwards to the umbilicus, and downwards to the pubis. The overlying skin was normal, but there was a definite ecchymosis present over the left half of the scrotum. Apart from some evidence of chronic bronchitis no other abnormal physical signs were found. The blood count was normal; the platelets were not counted; the bleeding time was normal. He was kept under observation in bed, but on the eighth day of the illness the pain recurred, the haematoma increased in size, and exploration was decided upon.

At the operation the subcutaneous tissues were found to be normal. The rectus muscle itself was infiltrated with dark brown blood clot, but no rupture of the muscle was to be seen, and there was no free blood in the peritoneal cavity. Removal of the clot was impossible owing to its intimate connexion with the fibres of the rectus muscle itself. There was a very free oozing of blood from the muscle during the operation, and haemostatic mattress sutures were necessary. After the operation a slight but steady oozing of blood from the wound persisted for two days; it was treated with local pressure and the subcutaneous injection of 10 c.cm. of normal horse serum. The temperature ranged from 98° to 99.5° F. On the fourth day after operation he suddenly collapsed, vomited about two pints of dark blood, and died within the hour. No necropsy could be performed.

CASE II.

A woman, aged 43, was sent to hospital suspected of having a twisted ovarian cyst. She stated that during a severe fit of coughing she felt a sharp pain in the right lower abdomen; this pain made her feel very giddy, and she vomited twice during the next hour. After two hours the pain somewhat abated, but any active movement elicited it afresh. During the previous few years she had noticed that the slightest injury would cause a bruise; she had also been subject recently to attacks of bronchitis; otherwise she had always been a healthy woman, and her menstrual history was normal. She had had two normal labours.

On examination I found a tender swelling of the lower half of the right rectus muscle. The skin overlying the swelling was normal, but on the right labium majus there was a recent, though faint, ecchymosis. In addition several bruises, both recent and fading, were present on the legs and arms, although she recollected no injury. Blood examination revealed no abnormality, but a platelet count could not be made.

She was kept under observation for two weeks, by which time the swelling had almost disappeared. As the pain and tenderness had by that time quite disappeared, she was discharged from hospital.

A comparison of the foregoing cases with those previously described in the literature enables a criticism to be made of the etiological factors concerned in the production of these spontaneous haematomas—abdominal apoplexies, as they have been called. The very rarity of the lesion points to some other cause than the concurrence of the strain of coughing, which is the usual exciting cause, and the special anatomical features of the deep epigastric artery. Moreover, the operative findings show that the primary lesion is neither a rupture of the muscle nor of the artery.

It appears most probable that these spontaneous haematomas are related to systemic affections. In the present two cases the underlying cause was the coexistent blood disorder, manifested in the one instance by the history and the terminal haematemeses, in the other by the history and the simultaneous presence of subcutaneous haemorrhages in other parts of the body. This relationship of spontaneous haematoma of the rectus muscle to a haemorrhagic diathesis has not been previously emphasized, but Stoeckel⁸ has described a similar case associated with generalized petechiae. Moreover, Lockyer, in a discussion of Andrews's cases, called attention to the frequency of such haematomas in pregnancy complicated by renal changes, and either abortion or accidental haemorrhage. In this regard it is now recognized generally that a fairly large proportion of the accidental haemorrhages of pregnancy—in some ways a not dissimilar condition—are related to systemic affections, though not indeed to blood disorders with any frequency.

The immediate cause of the haemorrhage into the rectus in these cases is probably, as Grignani⁵ states, the prolonged capillary and venous congestion produced within

the muscle by a paroxysm of coughing. Palpation of the lower abdomen during such a paroxysm will demonstrate a surprisingly sustained and continuous contraction of the rectus muscle, particularly in its lower half. The actual strain of the muscle is not itself productive of the haemorrhage.

With regard to the diagnosis of such cases, stress must be laid on the symptoms of peritoneal irritation that occur. Such symptoms have been noted in most of the recorded cases, and were present in both of the cases just described, leading to the initial diagnosis for each of an acute intra-abdominal lesion. The ecchymosis of the external genitals in either case proved a valuable indication of the nature of the swelling within the rectus sheath, forming as it did quite soon after the first appearance of the haematoma. The chief value of exploration of the swelling would seem to be the establishment of the diagnosis, which must in many cases be doubtful without it. Unless the swelling is very large or some complications arise, there is little to be done at operation.

Summary.

Two further cases of spontaneous haematoma of the rectus abdominis muscle are described, and the etiology and diagnosis of such haematomas are discussed. Their relationship to systemic conditions, and in particular to the haemorrhagic diathesis, is emphasized.

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MYOSITIS FIBROSA PROGRESSIVA.

BY

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MYOSITIS FIBROSA can be defined as a disease in which the various muscles of the body undergo a fibrous change. The literature of the disease is very sparse, and it is not mentioned in Boyd's *Surgical Pathology*. The condition is very rare; it is said to be more common in females than in males, and most of the cases reported have been in children.

Two types have been described: the localized and the generalized.

The Localized Type.—In this type one or more muscles have undergone a fibrous change, and the patient has not suffered any considerable disability. Deformities such as torticollis and talipes have been an end-result, but these deformities have not been severe.

The Generalized Type.—Here many muscles are involved. The main part of the musculature of the body may be transformed into fibrous masses which may be so disabling as to cripple the patient seriously or render him an easy prey to pneumonia. The disease apparently attacks the voluntary muscles only, those of the back and upper limbs being the most commonly affected.

Clinically the disease is indicated by the appearance of swelling in a part or in the whole of a muscle. This swelling occurs generally near one of the attachments of the muscle. It is hard, diffuse, and painless; and although within a few days it decreases in size and feels harder, there is left a permanently indurated area in the muscle concerned. Sometimes a swelling which is decreasing in size suddenly increases again and then decreases. This change in the muscle corresponds to a formation of fibrous tissue in the musculature, and is unaccompanied by any rise of temperature or any feeling of malaise. Examination of the blood reveals nothing abnormal, and the Wassermann reaction is negative. Microscopically there is a general increase of fibrous tissue among the muscle fibres. The fibrous tissue appears to surround and invade the muscle fibres, which degenerate and disappear. Round-celled infiltration is noticeably absent. The fibrous tissue appears to be well supplied with blood vessels.

The cause of the disease is unknown, and treatment has little effect on its progress. In some cases massage and electrical treatment has produced some improvement, but the most that such treatment can be expected to accomplish is to prevent deformities from occurring as a result of the contraction of the fibrous tissues.

Myositis fibrosa can be compared with the following diseases causing a change in muscles: (a) myositis ossificans progressiva, (b) so-called congenital torticollis, (c) Volkmann's ischaemic contracture, (d) true chronic metritis, and (e) acute polymyositis. Such conditions as tuberculous, hydatid, pyogenic, syphilitic, and others of known pathology affecting muscles will not be considered.

Myositis ossificans progressiva bears a very close resemblance to myositis fibrosa. In both conditions muscle undergoes degeneration. In one the muscle is replaced by fibrous tissue; in the other the increased formation of connective tissue is followed by a deposit of bone in the muscle. It would appear at first sight that myositis ossificans is but a later stage of myositis fibrosa; this, however, is not borne out by clinical evidence. Stunting of the big toe has been noted in myositis ossificans progressiva, but this is absent in myositis fibrosa. Probably both diseases are a result of an inherent degenerative process of muscle which, in one case, stops short at the connective tissue stage, and in the other goes on to bone formation.

Both Volkmann's ischaemic contracture and so-called congenital torticollis have been regarded as due to vascular obstruction causing a degenerative fibrous process in muscle which finally ends in contracture, but apart from the pathological condition they appear to have no relationship with myositis fibrosa. It is curious that in the case reported in this article torticollis occurred at one stage and gave a clue to the diagnosis.

Fletcher Shaw has described three types of chronic metritis, one of which he calls "true chronic metritis." In this condition the main part of the uterine musculature is replaced by fibrous tissue, and the condition has been regarded as a result of chronic nephritis or arterio-sclerosis. It appears that the disease is due to some unknown toxin, and the toxin theory might explain the process undergone by the muscles in myositis fibrosa.

In acute polymyositis there is an acute inflammatory condition resulting in degeneration of the muscle fibres, though the responsible toxin is unknown.

The patient whose case is here recorded came under my care at Tilbury Seamen's Hospital.

A girl, aged 3½ years, was admitted as a patient suffering from Pott's disease of the dorsal spine. The child had been perfectly well, but the mother had noticed for about a month a swelling about the size of a five-shilling piece on the right side of the spine in the region of the scapula. This swelling was hard, painless, not attached to the skin, and had no palpable edge. It was movable across the direction of the fibres of the rhomboid muscle but not along them. Movements of the spine were quite free, and the child appeared quite happy. X rays revealed nothing abnormal. No focus of sepsis was discovered. In the lumbar region on the right side there was a similar swelling of a smaller size, apparently involving the erector spinae muscle. Further examination revealed that the movements of the left shoulder were considerably diminished. Abduction was limited to 20 degrees. External and internal rotation were also limited. The scapula was freely movable. The insertions of the muscles around the shoulder-joint felt harder and more tendinous than usual. The Wassermann reaction was negative.

The child was sent to see several surgeons, who all diagnosed the condition as sarcoma. She was watched, and the swellings appeared to enlarge and then to diminish in size; they did not disappear, but left a hard indefinite mass in the muscles involved. Later a swelling appeared in the left sterno-mastoid in its upper quarter and went through the same changes. The child then acquired a left torticollis. A fortnight later the right sterno-mastoid became involved and contraction occurred. The left pectoralis major at its origin then became involved and showed a large swelling about 4 by 5 inches in size. Both shoulder-joints now showed restricted movements. The right brachialis anticus in the region of the elbow-joint became affected, and the condition in this part closely resembled myositis ossificans traumatica. There was limited extension of the right elbow-joint.

A portion of the pectoralis major was excised under anaesthesia and was sent for microscopic examination. Dr. Arthur Davies, pathologist to the Seamen's Hospital, reported as follows:

"Sections show a considerable excess of fibrous tissue replacing and surrounding bundles of muscle fibres. In one part of the