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ON A CASE

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OF

SYPHILITIC AFFECTION OF THE LIVER.

BY

T. GRAINGER STEWART, M.D., F.R.C.P.E.

Pathologist to the Royal Infirmary, Lecturer on General Pathology and Pathological Anatomy,
Edinburgh.

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STRENGTH OF THE LAYER

The following table shows the results of the tests made on the various layers of the soil. The first column gives the name of the layer, the second the depth in feet, the third the weight of the soil in pounds per cubic foot, and the fourth the strength of the layer in pounds per square foot. The strength is given for both the dry and wet states of the soil.

Layer	Depth (ft)	Weight (lb/cu ft)	Strength (lb/sq ft)
Topsoil	0-1	120	1000 (dry) 1200 (wet)
Subsoil	1-2	110	800 (dry) 1000 (wet)
Clay	2-3	100	600 (dry) 800 (wet)
Sand	3-4	110	1000 (dry) 1200 (wet)
Gravel	4-5	120	1200 (dry) 1400 (wet)

The results of the tests show that the strength of the soil increases with depth. The topsoil is the weakest layer, while the gravel is the strongest. The strength of the soil is also affected by its moisture content. The wet soil is stronger than the dry soil.



ON A CASE

OF

SYPHILITIC AFFECTION OF THE LIVER.

IN the following paper I propose to describe a rare form of waxy or amyloid degeneration of the liver, and to indicate its relation to the hitherto recognised syphilitic affections of that organ. The patient from whose body the specimens were obtained was under my observation for about four years, and the history of his case has been recorded as a typical instance of the symptoms which attend the waxy degeneration of the kidneys and other organs.¹ I subjoin an abstract of the case.

Edward Burns, a bricklayer's labourer, aged thirty, first came under my observation in the Royal Infirmary, in January, 1860. His general health had previously been good, excepting that for some years he had been affected with constitutional syphilis. His throat was ulcerated, his voice was husky, and he had a harsh cough. The respiratory murmurs were harsh, but the percussion notes were normal; the cardiac sounds were natural; the blood was poor in corpuscles, the white relatively more numerous, the red pale and flabby. The tongue was clean, the appetite pretty good, and the bowels open. The liver extended from the sixth rib to the umbilicus; the spleen was also enlarged. He passed upwards of 100 oz. of urine daily; it was of low specific gravity, never contained a trace of sugar, but abundant albumen, and a few hyaline tube-casts. There was no dropsy, or at the utmost a little œdema of the feet at night. He remained in the Infirmary about four months, and under iodide of potassium his liver diminished considerably. During the years which followed, his liver gradually diminished, while his urinary symptoms remained unaltered. The respiration became by degrees more interfered with, and ultimately a blowing murmur with the first sound became audible over both base and apex of the heart. He died in November, 1863, of bronchitis and œdema of the lungs.

Autopsy.—The body was somewhat emaciated. The heart was enlarged; its left side was much hypertrophied; the aortic valves were competent, but there was a calcareous mass at the base of one of the

¹ Edin. Med. Journal, Feb. 1861, and Aug. 1864.

segments; the aorta was very atheromatous. The lungs were extremely œdematous; the bronchi were congested, and full of mucus. The liver was about the natural size; on its surface were a number of nodules and cicatrices; at the bottom of some of the latter nodules were visible. On section, numerous nodular masses were found scattered throughout the organ; they were pale in colour, dense in structure, and in their general appearance closely resembled bees'-wax. Their structure was very much denser than that of the surrounding tissue. In some nodules there were streaks of fibrous tissue throughout the substance and round the margin; and the greater the proportion of these tissues, the deeper were the cicatrices. In the nodules which were elevated above the surface there were no such streaks, or very few; in those situated at the bottom of deep cicatrices the fibrous element was abundant, or even in excess of the glandular. The fibrous bands passed into the tissues around the cicatrices and nodules. On applying iodine to these masses, the whole of the waxy-looking material assumed the brownish-red colour characteristic of the amyloid degeneration; but the fibrous streaks simply assumed a yellow tinge. On microscopic examination, the masses were found to be composed of amyloid or waxy hepatic cells; enlarged, transparent, and finely granular. In some parts the cell-elements were broken down, and a finely granular material, containing some oil-globules, was present. The fibrous tissue in the masses presented exactly the characters of ordinary connective-tissue; and where it was most abundant the cells were most atrophied. Throughout the rest of the organ the cells were little affected with the waxy degeneration; but some of the small vessels showed it distinctly. The spleen contained one cicatrized mass, which presented no reaction with iodine. The cortical substance of the kidneys was somewhat contracted; the small arteries and Malpighian bodies afforded an excellent example of the amyloid degeneration. There was some degree of amyloid degeneration in the villi of the small intestine; the bowels were otherwise natural. The prepuce presented traces of an old chancre, and it had been previously ascertained that there were numerous syphilitic ulcerations of the throat.

It is evident that the waxy degeneration of the liver, in this case, was very different from the form of that degeneration usually met with in two respects—viz., first, that in the bulk of the organ, instead of affecting the cells it affected the vessels; and secondly, that groups of nodules in individual parts had become completely degenerated, every cell presenting an exquisite specimen of the degeneration, and the masses scattered like cancer nodules throughout the whole substance, and presenting an appearance exactly like bees'-wax.

It is well known that the amyloid degeneration is closely related to constitutional syphilis, and in this case there can be little doubt that it was induced by that affection; but the peculiar form which occurred in the liver bears a certain relation to the hitherto recognised effects of the venereal poison on that organ, and seems to me to throw light upon the mode of origin of these lesions. Let us therefore first inquire what are the venereal affections of the liver.

Professor Dittrich, of Prague, first drew attention to these affections

in his excellent paper in the 'Prager Vierteljahrschrift' for 1849. The conclusions at which he arrived were the following :

1. The participation of the liver in constitutional syphilis consists in an inflammatory exudative process, of which the most common termination is healing, either perfect or imperfect, leaving a cicatrix composed of fibrous tissue, with or without some granular matter enclosed within it. The exudative process never affects the liver substance as a whole, but only individual scattered parts.

2. The healed exudative process in the liver sometimes leads to no apparent consequences, sometimes to important lesions of the organ itself, or of the whole organism.

3. The participation of the liver in the syphilitic infection is usually in the period of the so-called secondary affections.

4. The rest of the organ may be subject to syphilitic or non-syphilitic affections.

5. The syphilitic blood-disease is either simple or combined with other dyscrasiæ, particularly the tuberculous, and the exudations in the liver are correspondingly modified.

That an exudative process is at the foundation of the syphilitic affection of the liver Dr. Dittrich thinks beyond doubt, although from the non-fatal character of the affection the earlier stages of congestion, swelling, and exudation are not seen. He conceives that the products vary according to the character of the exudation—one part plastic and capable of organization with fibres, another soft and glue-like, and more or less readily absorbed and removed. In a third part another form appears, which neither goes on to form fibres nor is absorbed, but gradually dries up, becomes firmer and harder, and forms a greyish white or whitish yellow mass of a tough and leather-like consistence. Microscopic examination shows that these are composed of fatty and other granules, structures resembling nuclei, and shrivelled atrophied cells and ill-formed connective-tissue.

Such are the views of Dittrich as to the characters and mode of production of the syphilitic affections of the liver. I shall quote from him one special description of a case closely resembling mine:—"On the surface of the liver were numerous cicatrized depressions; in the deeper part of both lobes there were yellow rounded masses of the size of a hazel-nut, which showed towards the surface a lardaceous, fibroid, callous tissue, with a yellow, cheesy, tuberculous mass enclosed in the centre." The proportions of these two materials varied in different nodules.

The observations of Virchow¹ and Wilks² have extended, confirmed, and in so far corrected the opinions of Dittrich; and the general view of pathologists is that, in connexion with constitutional syphilis, cicatrices and occasional nodules are met with in the liver, and that they are results of a simple or gummy inflammation of portions of the organ.

This case, I think, proves that the cicatrices may result from amyloid or waxy degeneration. There can be no doubt that the lesions

¹ Virchow's Archiv, Band xv.

² Wilks on the Syphilitic Affections of Internal Organs.

in this case were results of syphilis, that they occurred in a syphilitic patient, and presented the characters of such affection. I shall therefore take this for granted, and proceed to inquire as to their probable mode of origin. The constant association of the cicatrices with the waxy masses make it essential for us to consider the two lesions together, and it seems to me that only three hypotheses can be advanced—viz., 1. That the two are quite independent lesions. 2. That the formation of the waxy masses is secondary to the cicatrices. 3. That the cicatrices are results of transformation of the waxy masses.

The first of these theories is untenable, seeing that all the cicatrices had waxy masses at their bases or in close connexion with them, and that, as we shall presently see, definite relationship existed between the two. The second also falls to the ground, when we consider that there were many waxy nodules in the organ when there was scarcely a trace of cicatrix, and no cicatrix when nodules did not exist; and even when they co-existed, the deeper the cicatrix was, the less was the nodule, while it would have been natural to expect if the nodules resulted from the cicatrices that the reverse would have been the case. The third hypothesis, on the other hand, is recommended to us by many considerations. There was no cicatrix without a corresponding waxy mass, and there were many masses without a cicatrix. This fact alone renders it very probable that the cicatrices resulted from the masses; but when we inquire more closely into their structure, it becomes much more apparent, for then it becomes evident that the depth of cicatrix bore a definite relation to the condition of the masses. Some of them consisted simply of extremely degenerated cells. This appeared to be the first stage; and so far from there being any cicatrix connected with them, they formed prominences above the general surface. (Fig. 1.) Others had bands of connective-tissue radiating among their waxy masses, and the gland-cells were proportionally atrophied. This seemed to be the second stage, and with it a certain amount of depression and puckering of the surface was observed. (Fig. 2 *a*.) Others, again, had comparatively little gland-structure and a greater proportion of connective-tissue. This is the third stage, and with it the deepest cicatrices were associated. (Fig. 2 *b*.) It is thus apparent that the cicatrices were distinct in proportion to the alterations in the waxy masses. In one part, indeed, the gland-tissue had almost disappeared, leaving only groups of molecules, nuclei, and disintegrating cells, and only the fibrous masses remained, and in that part the deepest cicatrix in the whole organ was situated.

But granting that the waxy masses preceded in order of time the formation of the cicatrices, it might be asked whether they were not peculiarly modified gummy tumours, and thus the change might yet be traceable to inflammation. A glance at their microscopic structure disposes of such a view, for it shows that the masses were composed of closely aggregated degenerated hepatic cells; and presented none of the characters of a gummy tumour.

The series of changes, then, I conceive to have been the following:

1. Extreme waxy or amyloid degeneration of certain districts or groups of lobules in the liver. (Fig. 1.)

2. A development of connective-tissue in these masses, gradually causing atrophy of the degenerated gland-cells, and leading to the formation of cicatrices. (Fig. 2 *a*.)

3. The cicatrized condition—bands of fibrous tissue radiating from a dense centre into the surrounding tissue, and enclosing within the remains of the broken down degenerated cells. (Fig. 2 *b*.)

This last is the condition which has been most frequently met with, and we can easily understand that such should be the case when we reflect upon the non-fatal character of the disease.

I do not, of course, deny that syphilitic cicatrices may arise from gummy or simple inflammations as has been described, but I think that the single instance I have adduced proves that they may be formed in another and altogether different way. It should also be borne in mind that no positive evidence has been adduced that inflammation precedes the formation of the cicatrices, while here, though only in one instance, we have a demonstration of the different stages. And this case opens up most interesting lines for further inquiry, particularly as to whether many syphilitic cicatrices throughout the body do not owe their origin to the waxy degeneration, and as to the whole relation of syphilis with lesions of this class. It reminds me forcibly of a statement made by Von Baerensprung, that he saw the characteristic amyloid reaction in matter derived from the base of an indurated chancre, and of a statement made to me by Dr. Patrick H. Watson, that he has often seen the skin of syphilitic patients in the Lock Hospital, in Edinburgh, present on section a peculiar waxy look, and that in one particular case he cut through the firm waxy skin, and not a drop of blood escaped. He did not test it with iodine, but afterwards surmised that he might have obtained the characteristic amyloid reaction, as the tissues presented exactly the appearance of waxy organs. Further observation may prove that a waxy or amyloid degeneration is more common, and leads to more secondary lesions than has been hitherto supposed.

I have published this case and these remarks now because I am anxious to direct attention to the subject, and from the rarity of such lesions I might have to wait long ere another case came under my notice.

P.S.—Since writing the above I have examined the specimens of syphilitic affection and of waxy degeneration of the liver in the pathological museums of Berlin and Prague, and found none exactly corresponding with that which I have described. Professor Virchow informed me that he had only once met with a *mass* of amyloid matter in the liver; that that mass was solitary, and that he had not made out its mode of origin. We examined the specimen, which had been for some time in spirit, and found that it contained some waxy matter and some fibrous tissue, but were unable to satisfy ourselves regarding it. (Sept. 1864.)

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