CASE OF LYMPHO-SARCOMA, ASSOCIATED WITH LEUCOCYTHÆMIA.

By R. SHINGLETON SMITH, M.D.Lond., B.Sc.,
Physician to the Bristol Royal Infirmary.

WILLIAM POPE, aged 31, married, was admitted into the Bristol Royal Infirmary, under the care of Dr. Beddoe, on July 2nd, 1873, with enlarged spleen. He had been a shoemaker in the army. In 1861, he went to the Mediterranean, and was laid up with "fever" whilst at Beyrout. During three months, he frequently had attacks of shivering, but they did not recur at regular periods. He had had feverish attacks every year at the spring and fall since that time. His general health continued fairly good till a month ago, when he noticed some enlargement and felt pain in the abdomen, which rendered him unable to continue his occupation as shoemaker.

On admission, he was noticed to be thin and markedly anæmic. He had a large abdominal tumour (manifestly spleen) occupying the left side of the abdomen, forwards to the middle line and below as far as the crest of the ilium, with a solid feel, dull on percussion, smooth on the surface, with a rounded edge in front. Liver-dulness was not increased, but the splenic dulness merged into that of the liver. He complained of some tenderness over the splenic tumour. Evening temperature was 99 degs., morning 98 degs. Tongue clean; appetite good. His urine was pale, acid, with fawn-coloured lithates, normal in quantity and free from albumen. The blood was found to contain a large excess of colourless corpuscles; they were about equal in number to the red blood-discs. In addition to the abdominal tumour, he had noticed a swelling over the sternum, which first manifested itself two months previously to his admission to the infirmary. At the time of the first examination, it was about the size of a walnut, situated over the cartilage of the first rib and the part of the sternum adjoining the right first rib; it was hard and painless, but the skin over it was of a dusky venous colour and firmly adherent; it could not be moved in the cellular tissue, and was very ill defined at its margin. It presented the character of an infiltration in the skin and other tissues over the bone and cartilage, rather than those of a defined new growth pushing aside the normal tissues of that region. There was no history of his having received any injury at the spot. No indications of syphilitic taint could be discovered. He was ordered quinine in five-grain doses twice a day, and a drachm of syrup of iodide of iron three times a day.

On August 30th, he was ordered iodide of potassium in twenty-grain doses three times daily, and this drug was continued in full doses for three weeks, but without any manifestation of improvement.

On September 12th, it was noted that the swelling over the sternum was increasing rapidly, and that an additional swelling had appeared in the left posterior triangle of the neck, over the clavicular insertion of the sterno-mastoid muscle, but not isolated, as a hard cord could be felt extending to it from the episternal growth, the skin between the two tumours being indurated by some interstitial infiltration.

On October 12th, the tumour over the sternum had much extended; there were general infiltration, gradual and progressive, of all the tissues around, and considerable increase in the depth of tissues between the skin and chest-wall; several hard cords could be felt in the skin around the growth; there was induration of the tissues around the base of the neck, and a hard mass could be felt in the posterior triangle of the right side similar to that on the left. The cutaneous veins around the tumour in the part still free from induration were in a varicose condition. The centre of the growth was of a dark red colour, and now covered with a hard dry scab, the result of spontaneous vesication. No nodules could be felt in either axilla. His general health was not much impaired; he was able to get about, to eat and sleep well. The spleen was smaller. He was still anæmic, but not losing flesh; the proportion of colourless corpuscles in the blood was increasing. At this date, he was sent into the country a few miles; but, soon after he reached his destination, the swelling over the sternum began to bleed, the blood seeming to come from small arteries in the skin which were opened by the cracking of the scab on the surface of the tumour. The hæmorrhage recurred frequently during the ensuing three or four weeks, but was stopped without much difficulty by torsion and pressure.

On October 22nd, he was well enough to be brought back to the infirmary. He had not been in bed during the whole time of his absence, but lay on a sofa, and did not dare to move for fear of hæmorrhage. He was much blanched from loss of blood, and the spleen was much smaller than before; but there was nothing cachectic in his aspect; his

appetite continued good, and there was very little constitutional disturbance. His eyelids had become oedematous, and there was general puffiness of the face, with œdema of the right arm and hand. Some induration could be felt in the right axilla, and there was a brawny oedematous condition of the whole upper arm. The veins of the right side of the abdominal wall were becoming enlarged and tortuous. The skin immediately around the tumour was full of small veins in a varicose condition. The surface of the tumour was raw and secreted a thin serous discharge; there was no tendency towards sloughing, but merely superficial excoriation; the secretion drying caused scabs, which cracked frequently, and then hæmorrhage occurred in small arterial streams of pale watery blood. There was almost complete absence of sensation over the whole of the diseased tissues, contrasting strikingly with the intense pain from tension of inflammatory swelling.

October 25th.—Three days later, œdema of the left arm first came on.

October 30th.—There was now considerable swelling of face and both upper extremities, also enlargement of the epigastric veins, suggestive of pressure on the vena cava superior; but indurated masses could be felt in both axillæ, and the lower part of the neck was a hard brawny mass as high as the cricoid cartilage, feeling very much as if the tissues had all been infiltrated with plaster of Paris. There was now difficulty in swallowing, and his neck felt "tight and obstructed". The general varicose condition of the cutaneous veins on the right side of the thorax caused blue discolouration from the right axillary line to the median line, and from above the transverse line through the nipples down to the edge of the ribs.

October 31st.—There was some dyspnoea, which was relieved after copious bleeding from several points of the tumour at the same time, the blood being of very thin consistence, with little coagulating tendency.

November 3rd.—Death took place from exhaustion induced by repeated hæmorrhage.

Examination, twenty hours after death.—There was a large raw surface over the upper part of the sternum and the lower part of the neck, extending from the third ribs below as high as the cricoid cartilage, and from the middle of the clavicle on one side to a similar distance on the other side of the median line. A thin scab, consisting of dried blood and secretion, covered the whole of this surface; but this could be peeled off, leaving a cuticular surface underneath almost intact. There was no loss of tissue, no sloughing or indication of gangrene. Some enlargement of the cutaneous veins was still visible, but much less than during life. There was some oedematous infiltration of the tissues over the upper half of the abdomen and the lower part of the thorax, with considerable œdema of both upper extremities, but no œdema of the legs. On cutting into the tissues over the sternum, they were found to be much infiltrated, firm and unyielding to the touch, but easily torn and cut, one inch and a half in thickness at the middle line over the manubrium sterni, but much thicker opposite the middle of the clavicle. No separation could be traced between the skin and the tissues beneath, everything down to the bone being of uniform consistence, pale in colour, not exuding any juice from the cut surface. All the tissues of the neck were infiltrated in a similar way, and some rounded masses existed in each axilla, connected with the central growth by bands of indurated tissue. In the anterior mediastinum, there was a firm fibrous growth surrounding and compressing the innominate veins; this growth was in direct continuity with the infiltrated tissues in the neck, all the cellular tissues in this region being alike affected successively by a process of gradual infiltration from the primary source in the skin, the morbid process having proceeded from the skin towards the neck and thence behind the sternum and clavicles to the mediastinum. The sternum itself was slightly softened, but there was no thinning of the bone and no abnormality visible in its coarse structure. The lungs were not invaded by the morbid growth; there were no adhesions, and they were crepitant universally. The heart was soft; its fibres pale; its right ventricle full of pale, very slightly coherent clot, surrounded by an opalescent milky fluid. The blood everywhere was pale and watery, and most of the organs were markedly anæmic. The liver was enlarged, soft, slightly fatty. The spleen weighed four pounds. Several pale patches were noticeable of a more or less conical shape, the base being at the surface of the organ. The kidneys were pale, bloodless, but of normal size and structure. A small rounded fibroma was visible in one of the cones towards the apex, about the size of a pea. There was no enlargement of the lumbar or of any other glands, except those in the axilla.

The parts examined microscopically were: *a.* The superficial part of the growth over the sternum; *b.* The deep part of the growth; *c.* The tissues in the anterior mediastinum; *d.* The tissues in the right axilla; *e.* The spleen; *f.* The kidney.

The pathological peculiarity common to all the tissues of *a, b, c, d* was "an infiltration of the normal tissues of the part with numerous small cells imbedded in a faintly reticular stroma". The cells had for the most part an oval or rounded outline with a granular appearance, giving them some resemblance to pus-cells or colourless blood-corpuscles. Acetic acid disclosed the existence of one large nucleus or of two or three small ones. Almost the whole cell became coloured with carmine, so that the nuclei were not easily distinguishable from the cell-wall. With these nucleated cells were interspersed numerous small nuclei free, not indicating any cell-wall with acetic acid. The cells varied in size in the different parts. In the axillary growth, where there was least of the fibrous element, there the cells were largest; they ranged from the $\frac{2}{1000}$ th to the $\frac{3}{1000}$ th of an inch. Here and there, a small oil-globule was seen in the centre of the nucleus and two or more small nucleoli. There was no indication of anything resembling an *alveolar stroma*, such as exists in carcinoma; the cells were scattered about amongst the original elements of the parts involved without order or regularity, infiltrating and pushing aside the original tissues amongst which they were developed.

a and *b*. The growth over the sternum consisted of, first, a layer of epithelium, the normal cuticular layer of the epidermis, but much thickened, the epithelium dipping down into the tissues of the cutis in long lines between ridges of infiltrated tissue. Beneath this epithelial layer were bands of a fibrous tissue infiltrated sparingly with cells, the latter becoming more and more numerous till nothing but cells in a faintly reticular stroma was visible; below this was another fibrous layer, consisting of long bands of white fibrous tissue, with here and there streaks of cells running longitudinally between the fibrous bands. Immediately on the sternum was the fibrous periosteum, in which no cellular infiltration was discoverable. (Fig. 1.)

Fig. 1.—Section through the Cutaneous Tissues over the Sternum. *a*. Epithelial Layer. *b*. Epithelium dipping down into the Cutis. *c*. Fibrous Tissues of Cutis Infiltrated with Cells.

c. In the *anterior mediastinum*, the fibrous element was much more abundant than externally; but it was everywhere interspersed with the cell-growth. The cells were arranged in rows and masses between bundles of fibrous tissue and between bands of striated muscular fibre (*triangularis sterni*); the intermuscular tissues being infiltrated, the fibres themselves in a normal condition. (Fig. 2.)

d. In the *axillary growth*, the fibrous element was almost absent, the cells being packed together in a very firm stroma, separating easily from each other, larger in size than elsewhere, mostly rounded, but with a tendency to the spindle shape; the nuclei were distinct from the cell-wall, and easily coloured with carmine. On removing the cells from the tissue by washing and pencilling, a finely reticulated stroma remained, similar to that of a healthy lymphatic gland. (Fig. 3.)

e. The *spleen* contained cells of similar character to those of the other diseased tissues, infiltrating a fibrous network with fibrillary reticulations. Masses of dark red granules were seen infiltrating the fibrous stroma in patches, which appeared to be due to fatty degeneration commencing in the fibrous stroma of the organ.

Fig. 2.—Section of Growth from the Anterior Mediastinum, showing transversely Striated Muscular Fibres (*triangularis sterni*) with new Growth infiltrating the Intermuscular Septa, Cells separating the Fibres.

Fig. 3.—Cells removed from a Section of the Axillary Growth, and treated with Acetic Acid.

f. The small white tumour visible in one of the cones of the kidney presented under the microscope a fibrous structure, but it had no definite sharply defined margin. Wasted tubes and shrivelled granular cells lining them were interspersed amongst the fibrous tissues towards the edge of the growth; but, internally, the tumour consisted entirely of white fibrous tissue. The kidney-structure outside the fibroma presented the normal characters.

REMARKS.—This patient seems to add another to the now long list of recorded cases of *lymphoid growths*; but this instance presents several points of peculiarity in which it differs from most of the other cases to be found in pathological records. The *Pathological Transactions* of recent years contain reports of numerous cases, called by different names, in which tumours of lymphatic origin have been found occupying different regions of the body, more frequently the liver, spleen, and lymphatic glands, and in which leucocythæmia has existed. Dr. Wilks, in the *Guy's Hospital Reports* for 1856, details a series of cases of "Hodgkin's disease", in which there was general hypertrophy of the lymphatic glands and asthenia, but in which there was no excess of the colourless corpuscles of the blood.

Dr. Murchison, in vol. xx of the *Pathological Transactions*, gives an account of a case in which "lymphatic new formations" were found in the liver, associated with enlargement of the spleen, but not accompanied by leucæmia. Professor Virchow, too, has observed that the enlargement of the glands in cases of "leukæmic tumours" is often unaccompanied by leucæmia. In vol. xxi of the *Transactions*, Dr. Tuckwell reports a case of enlargement of the "lymphatic glands, with the formation of peculiar morbid growths in the spleen and peritoneum". Dr. Dickinson reports another of "lymphoid growths in spleen", and Dr. Murchison another, which is also reported on by Dr. Burdon Sanderson, of "lymphadenoma". In vol. xx, page 409, of the *Transactions*, a case is reported by Dr. Hermann Beigel from notes taken by myself, and which Dr. Beigel calls "lepra tuberosa", presenting similar pathological conditions, but not associated with leucæmia. All these cases seem to present one pathological feature in common, the development of morbid tissue of similar histological character, but varying according to the locality in which it is developed, and associated with different symptoms according to the organ or organs affected, and running a very variable history. Dr. Sanderson seems to have first described the real character and affinities of the growth; and Messrs. Cornil and Ranvier agree with Dr. Sanderson in the belief that the morbid growth consists of the adenoid tissue of His. The name "lymphadenoma" is that given by Messrs. Cornil and Ranvier; but, inasmuch as the condition is not always associated with hypertrophy of the glands, the more general name of "lympho-sarcoma" may be preferable. The case reported presents peculiarities.

First, as regards the *locality* in which the disease commenced. The growth was first noticed as a hard lump beneath the skin over the sterno-clavicular joint, from which point as a centre the morbid process extended to all the tissues around, and ultimately affected the glands of the neighbourhood; but the glands themselves were not primarily

affected, and did not become implicated afterwards, excepting by direct structural continuity with the focus of the disease.

Secondly, the absence of any tendency towards *suppuration*, sloughing, or gangrene was remarkable. There was no loss of tissue up to the time of death; vesication had occurred on the surface of the growth, but the part was still covered with epithelium. There was venous turgescence in all the infiltrated tissues, as indicated by the dark colour which they assumed; but microscopic examination did not indicate any marked vascularity, such as would have been the case if the development of new vessels had progressed *pari passu* with the growth of the disease. The original tissues became more and more swollen by a process of infiltration; but the new product did not manifest any tendency towards permanent organisation, nor did it manifest any retrograde tendencies.

Thirdly, the combination of a very rapidly growing lympho-sarcomatous growth with a condition of *leukemia* is interesting. What is the relation of the two? That the one is not indispensable to the existence of the other, is shown by the numerous reported cases where lymphoid growths have been found, and the blood has presented no abnormality. The history of this case can leave no room for doubt as to which was the primary condition: the spleen was enlarged and leukemia existed when the patient first came under observation, and at a time when the morbid growth was small. Growths of this kind must result from either—

a. Proliferation of the connective tissue-corpuscles.

b. Hyperplasia of adenoid tissue.

c. Development from the leucocytes of the blood which have escaped from the vessels, have retained their vitality, and have continued to reproduce similar cells in the part where they are found. It seems probable that, just as pus results from the escape of the colourless blood-corpuscles from the vessels, so a lymphoid growth may result from a similar cause by a slight modification in the nutritive changes which the cells undergo. Presuming, then, that it is possible for the tissues to become infiltrated with leucocytes from the blood, a morbid growth of lymphoid origin may be a direct, though not a necessary, result of leucocythæmia. The commencement of the process may be accidental; but, having once commenced, the leukæmic condition is likely to cause a very rapid growth in any part once affected. A lymphoid growth is likely, therefore, to be of short duration when associated with leucocythæmia, whereas, in other cases, the process may continue for several years. In the case of Pope, death took place in seven months from the first appearance of the morbid growth; but, in the clinically and histologically very similar case reported by Dr. Beigel as "*lepra tuberosa*", and in which the blood was in a normal condition, the patient lived for three years after the morbid growth first commenced.

The cause of death was asthenia, in consequence of frequently recurring hæmorrhage. The blood was thin, pale, and had little tendency to coagulate. If death had not resulted from this cause, it would have been impossible for him to survive the rapid spread of the morbid infiltration of his tissues which was going on; breathing and swallowing were becoming impaired from the infiltration of the tissues in the neck.

It would be interesting, in future cases of this kind, to note the appearance of the colourless corpuscles, particularly with regard to the activity or otherwise of their amœboid movements, also to compare the size of the leucocytes within the vessels with the cells which are found to infiltrate the diseased tissues.

RIGOR MORTIS IN AN INFANT AT BIRTH.

By J. ASHBURTON THOMPSON,

Surgeon-Accoucheur to the Royal Maternity Charity, etc.

DR. GRIGG has added two important observations to his first description of the above case; that the jaw again became fixed after extension had been made and the stiffness thereby removed, and that the legs were not so firmly set as the upper part of the body. These two facts, considered in relation to each other and the well known phenomena of *rigor mortis*, are all important, and may be admitted to establish the presence of that condition in the case described. It is much to be regretted that they were not included in the original report of it, which even now lacks the scarcely less important information as to time of examination, and of the return of stiffness to the forcibly extended muscles. With these additional facts at command, I am not surprised that Dr. Grigg declines to discuss his case with me.

Still, I must confess myself unable to share the conviction with which Dr. Grigg asserts his view; and it is possible that others of the Associates may feel sufficiently interested in the subject to make it worth

while to point out the chief difficulties to be met with in maintaining it. In the first place, bearing in mind that rigidity invariably occurs in the bodies of individuals, whether they die within a few hours of birth or at the most advanced age, the extreme rarity with which it has been observed in the fœtus at birth is enough to raise a suspicion that the latter is of another kind. Those who wish to maintain its identity with the former, must account for its rareness; they must show that the one or two cases in which it has been detected differ in some essential particular from all the other cases in which it has not occurred; for, since the *rigor mortis* is the result of a physical property of a constituent of the muscular mass, it must always occur under similar circumstances. This difference cannot exist in the time of delivery as compared with the time of death; because all those obstetricians of experience who have failed to note rigidity of the fœtus have had the opportunity of inspecting bodies at every period, from a few minutes to a few weeks after death. Secondly, granting the liability of the still-born to cadaveric rigidity, on what ground is it to be anticipated that it may show itself earlier in those than in other bodies? Still, bearing in mind that it is the result of a physical change, must not the same conditions always modify it in the same way? Dr. Grigg himself supposes this fœtus to have lived within an hour and a half of birth, and there is every reason to regard this as the extreme period at which death may have occurred; for the hæmorrhage—or, in other words, the partial separation of the placenta—only began at that time. It died, in fact, of asphyxia; and that is a tedious mode of death *in utero*. What conditions are here to favour the speedy occurrence of cadaveric rigidity? Not the mode of death—that is one cause of its delay in the individual; nor the temperature to which the body was exposed, for a high temperature has no influence over the time at which the rigidity occurs.* So the precipitate occurrence of rigidity under circumstances unfavourable to the development of true *rigor mortis* affords a further ground for suspicion that it is rigidity of another kind.

I say "suspicion," because I ventured an opinion on grounds which I still think not unreasonable; and to better reason such an opinion will always yield. While, therefore, I now admit willingly that Dr. Grigg did observe *rigor mortis* in his case, I do not yet see clearly that it occurred *in utero*. Cadaveric spasm is fairly described by many writers—by Taylor among others; and it is a peculiarity of it worth noting in this connection that, whether the result of a final act of volition or of convulsive action, it persists until the supervention of cadaveric rigidity. Not, therefore, because the latter state was observed by Dr. Grigg under these apparently so adverse circumstances, was it the only state which had affected this fœtus.

ON PLEURITIC EFFUSION.

By JOHN RICHARD WARDELL, M.D., F.R.C.P.,
Physician to the Tunbridge Wells Infirmary.

[Continued from p. 615 of last number.]

THE first means to be had recourse to in order to ascertain the presence or otherwise of thoracic effusion is *inspection*. When the condition now considered obtains, careful observation notices less mobility in the affected side. There is generally, at the lower third, a greater or less degree of bulging, and the surface looks smooth and rounded. The intercostal spaces are less defined, and the intercostal muscles are often absolutely motionless. When the liquid has for a long time been effused, the intercostal muscles, from having been continuously stretched, lose their contractile power, become paralysed, flat, and then even tend to protrude. Albertini supposed, and Stokes believed, that such state denoted pus. A decomposing and debased fluid in contact with the wall of the chest, it has been thought, is sufficient to produce such flabby and flattened condition of these muscles. When the effusion is considerable, there is, as the result of left pleurisy, visible displacement of the heart; the apex-beat may be seen far away from its normal position, at or beyond the right edge of the sternum, or below the ensiform cartilage in the epigastric region. I saw one marked example of such dislocation of the heart not long ago, where the apex-beat was near the right nipple. Murchison says there is greater danger of fatal syncope when the effusion is in the left side. My own experience is certainly that there is more frequently irregular and feeble heart's action in left-sided effusion. Increase of motion in the sound side is often apparent. The patient, when asked, will tell you he feels the air go down deeper into the one side of his chest than the other. The side of effusion not

* See Taylor's *Medical Jurisprudence*, 1865, p. 14; see also, at p. 13, the account of experiments by Sommer, who placed two children, born asphyxiated and still, in a tepid bath of from 90 deg. to 99 deg. *Rigor mortis* did not set in until between three and four hours.