AN ŒDEMATOUS FŒTUS, WITH ABSENT THORACIC DUCT.

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[Read in the Section of Obstetrics, December 21, 1888.]

I VENTURE to bring before this Section of the Academy to-night a short paper on an œdematous foetus, in the hope of inviting discussion on what is an extremely rare condition.

The specimen which I now show you was brought into the Rotunda Hospital by Mr. Taylor, on August 4th of this year. The mother, aged twenty-three, was an extern patient of the Rotunda Hospital, with a good family history. She had a healthy full-term child one year and seven months previously; her last menstruation was on March the 20th. The course of pregnancy was quite normal, until it was interrupted by a severe accidental hæmorrhage in the twentieth week; and it terminated on August the 4th in a premature delivery of twins, concerning one of which this paper is written. Nothing abnormal was observed with regard to the labour, the quantity of liquor amnii, or the placenta. One of the children, as you see, was quite healthy—it weighed three-quarters of a pound; length, ten inches, and I am informed made several attempts at respiration: the other weighed one pound; length, ten inches, and presented an extraordinary appearance; it looked like a mass of jelly. The head bore a curious resemblance to a large tomato; the pink transparent colour and the presence of frontal ridges made the resemblance singularly striking. The scalp was so distended that the bones could nowhere be felt, and the skin over the entire body seemed so tense that it was not possible to bend the limbs without the risk of bursting the skin. There was no pitting on pressure; on puncture a glairy fluid

resembling white of egg, escaped. The general appearance is fairly well shown by referring to the photograph, of which A shows the front, and B the lateral aspect of the fœtus. One observes the general plumpness of the body (the lower extremities have become completely shrunken by an accidental immersion in a strong alcoholic solution), the apparent complete absence of the eyes, and in the frontal region a distinct cleft running on either side upwards and outwards; it bifurcates about three-eighths of an inch from the nose into branches, one of which runs upwards and outwards, the other downwards and outwards, enclosing ridges, which suggest the undeveloped ocular vessels; and a fissure is also seen to run obliquely downward and inwards from the pinna of either ear.

The number of recorded cases of general œdema of the fœtus are very rare indeed. Prof. Delamotte's case in 1690 is, I think, the first, but interesting accounts are given by Betschler,^a Steinwirker,^b Lawson Tait,^c and others. Up to the present no satisfactory explanation has been given as to the causation of the general œdema. Dareste,^d while making experimental researches on the production of monsters, found, as a consequence of arrested development of the vascular spaces, that the blood corpuscles remain imprisoned in the cavities where they were formed, a general dropsy of the embryo follows, with a marked accumulation of fluid in the tube that forms the spinal cord and cephalic vessels; this was observed in chickens. Betschler^a believes the œdema to be due to an obstacle to the circulation in the umbilical vein; Steinwirker^b looks on it as elephantiasis congenita cystica, while Mr. Lawson Tait looks upon premature closure of the foramen ovale, which condition Dr. Sawyer found in his œdematous fœtus, as a predisposing cause for the universal œdema. All previous hypotheses appear to me untenable, the explanations given being for the most part speculative. I considered it most probable that the general œdema in this particular fœtus was due, as in the case of

^a Breslauer Klin. B. 1. L. 260.

^b D. i. Halle. 1872.

^c Obst. Trans. 1875.

^d L. Tarnier et P. Budin. 1886. Tome I., p. 354 et 355. *Traite Accouchements.*

hydrops occurring in the bovine species described by Prof. Franck, to an absence of the thoracic duct and mesenteric glands. This theory could only be satisfactorily established by a complete dissection, which Professor Birmingham, President of the Anatomical Section, kindly consented to undertake; and I am deeply indebted to him for the most thorough investigation of this subject, the result of which I have much pleasure in placing before you.

Anatomical Report.—The foetus looked like two tomatoes strung together—one being represented by the head, the other by the body. The head was extremely large, and was made up of a number of puffy swellings, separated by deep sulci. On the anterior aspect were two bulgings on each side, in addition a large one *above*, extending from the nose over the head, and a small one below the chin. The nose, the mouth, and the chin were almost completely buried beneath these overhanging swellings. From the round pimple-like nose there ran outwards and upwards on each side a deep sulcus, which bifurcated about three-eighths of an inch from the nose into branches, one of which ran upwards and outwards, the other downwards and outwards. Another deep sulcus ran down from the side of the nose on each side close to the middle line, and parallel to its fellow of the opposite side, separating the mouth and chin from the distended cheeks. The whole appearance at first sight reminded one of the visceral arches and clefts; but these apparent clefts are simply natural depressions which are made sulci, sometimes half an inch in depth, by the enormous oedematous distension of the subcutaneous tissue in the intervals between the depressions. On the surface—even upon going to the bottom of the sulci—no trace of an eye or eyelid can be found. On dissection a well-developed eye was discovered underlying the point of bifurcation of the fissure, which runs upwards and outwards from the nose, not under the rounded prominence in the angle between its branches, as might be expected. The subcutaneous tissue was oedematous to such a marked degree that in parts it was three-fourths of an inch in depth, while the subcutaneous tissue in the healthy twin brother is only about one-fiftieth of an inch in thickness. The muscles and the other

A. Birmingham del.

F. Huth, Lith^r Edin^r

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tissues of the body, which contain much areolar tissue, are also very œdematous.

The organs of the body generally, as far as examined, are normal, with the exceptions mentioned below; the heart is rather smaller as compared with that of the healthy fœtus; foramen ovale patent; the thyroid gland seems to be normal.

No trace of a thoracic duct could be found. I examined the fœtus with the special object of finding if this duct were present, and the greatest care was taken in examining the region in which it is generally found. I dissected the posterior mediastinum from the right side—no trace. I examined the junction of the jugular and subclavian veins carefully, with no result, both sides. I dissected the mediastinum from the left, examining that side of the vertebral column and aorta, and still with a negative result; then I went down along the aorta into the abdomen, and sought for the receptaculum chyli, with a similar result; so after a careful examination I was compelled to decide that there was no thoracic duct. Previously I had examined the healthy twin brother, and found the duct with the greatest ease in the normal situation.

Next I examined the mesentery for mesenteric glands—having previously found them present in large numbers and of considerable size in the healthy twin, with the naked eye; no glands could be made out. The mesentery is easily examined by holding it up to a bright light, when the slightest thickening is apparent, but no trace of a gland could be found by this means, even with a hand microscope, while, as stated, the glands are at once evident to the naked eye in the healthy brother.

Microscopic Examination.—To Dr. Earl, of Trinity College, my best thanks are due for the careful microscopic examination of portions of the specimen sent him. He writes:—The piece of skin examined shows very great thickening. In different parts of the sections, beginning at the deep surface and extending to the epidermis, dilated vessels are seen generally lying in smaller or larger groups. These are evidently lymphatic vessels, as some contain homogeneous masses of coagulated lymph. In the section stained in eosine the distinction of lymphatic and blood vessels

is well seen on account of the fact that eosine stains red corpuscles.

In the piece of the mesentery examined I found *nothing* of the nature of a lymphatic gland.

Arguing from the reports just read, I consider I am justified in stating that the complete absence of the thoracic duct lead to a blocking up of the entire lymphatic system, and imprisoning of the normal transudation in the dilated lymphatic spaces lead to the universal œdema.

A similar condition of complete absence of the thoracic duct and mesenteric glands in the human species has, after a most diligent search, I believe, not been observed up to this.

The obstetrical bearing of an œdematous foetus lies in the difficulty of diagnosing the presenting part, as is evidenced by the case reported by Mr. Lawson Tait, where a head presentation was mistaken for that of a breech; and that a general watery gelatinous infiltration of the subcutaneous tissue may lead to the gravest form of dystocia, is shown by the case described by Keith in the *Edin. Med. and Surg. Journal* for April, 1855.

EXPLANATION OF PLATE.

A. Portions of mesentery of normal foetus, showing numerous mesenteric glands (natural size).

B. Portion of mesentery of œdematous foetus, showing absence of mesentery glands (natural size).

C. Head of œdematous foetus, showing extraordinary appearance of parts produced by the œdema. No trace of an eye can be found on one side; it has been exposed by dissection upon the other (natural size).

D. Section of skin and superficial portion of subcutaneous tissue of œdematous foetus, showing the enormously enlarged lymph-spaces, some of which are partly or completely filled with a colloid-looking material, apparently coagulated lymph (magnified).