A CASE OF PERSISTENT VITELLINE ARTERY : FATAL INTRA-ABDOMINAL HÆMORRHAGE FROM RUPTURE OF THE VESSEL.

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WE believe that for several reasons there is sufficient justification to warrant the publication of the following case. The condition is one of considerable rarity, as is borne out by the fact that there are so few recorded examples in the literature. It is of interest from a developmental point of view. The reason, however, which really influenced us in publishing the case has been a clinical one: it illustrates a danger which previously we had not recognized, and it demonstrates how very narrow may be the margin between success and failure in what appears to be the simplest type of case.

Baby J. W. Age 4 months. Admitted Sept. 18, 1920.

History.—The baby was brought to hospital by the parents on account of a small tumour at the umbilicus. Attention was drawn to the tumour, not on account of its size, which was no greater than that of a pea, but because there was a persistent irritating discharge from its surface, which tended to produce excoriation of the surrounding skin.

On Examination.—The child was apparently healthy. At the umbilicus, and slightly buried within its folds, there was a small tumour the size of a pea, composed, one would say, of granulation tissue, and growing by a narrow pedicle from the deeper portion of the umbilicus. Its surface gave rise to a small amount of secretion. There was no sign of any cavity in its interior, and it did not appear to connect with any deeper abdominal structure. The condition was regarded as that of a simple umbilical granulation.

Subsequent History.—These conditions have always been treated upon the simple lines of touching the pedicle with the actual cautery, and this treatment was adopted in the case under review. The tumour was lifted from the umbilicus, and the pedicle was divided with the cautery. The condition was looked upon as entirely a minor one, but, as the child was a country case, it was admitted for a few days to the hospital wards. As events turned out, this was a fortunate occurrence. The child remained well for twenty-four hours, but after this period it began to show certain alarming features. The first intimation of anything wrong was several attacks of sickness. Gradually it became quite clear that the child was gravely ill. The pulse increased in

FIG. 341.—The appearance of the condition as revealed at post-mortem examination. A, Portion of anterior abdominal wall; B, Persistent vitelline artery; C, Sub-peritoneal hæmorrhage.

rapidity, and the appearance was one of considerable shock. It was very difficult to ascertain the origin of these alarming symptoms. There was no sign of any peritonitis. There was no obstruction; the bowel had moved in connection with the administration of rectal salines; and, to be correct, no actual diagnosis was come to beyond one of delayed shock. Unfortunately, the child succumbed within forty-eight hours of the original operation. The explanation is detailed in the following facts.

Post-mortem Examination. (*Fig. 341*).—On opening the abdomen, the peritoneal cavity was seen to contain a large quantity of blood, of which about four ounces were in the pouch of Douglas. There was no evidence of peritonitis or of perforation. A thin fibrous cord, one and a half inches long, stretched from the umbilicus a little to the left of the middle line, to the mesentery of the ileum, about eighteen inches from the ileocaecal valve. The actual attachment of this cord to the mesentery, which appeared to be half an inch from the gut wall, was hidden by a hæmatoma in the mesentery. This hæmatoma was about an inch in diameter, and at the apex was a small hole from which the blood had escaped into the peritoneal cavity. The other organs of the body showed nothing worthy of note.

On dissecting the cord through the hæmatoma, it was found to be attached to a branch of the superior mesenteric artery. This shows that the cord was the persistent left vitelline artery. Its lumen was completely obliterated, even at the junction with the superior mesenteric branch. Opposite the attachment of the vitelline artery there arose from the superior mesenteric artery a small branch which had been torn across, and this was responsible for the hæmorrhage.

During the operation, on lifting the tumour from the umbilicus, traction was exerted on the vitelline artery and, through it, on the main vessel, thus causing the rupture of the small branch. As a result, a hæmatoma was formed in the mesentery, and after this had attained a certain size, the stretched peritoneum over it ruptured, and blood escaped into the peritoneal cavity.

FIG. 342.—Primitive gut and yolk sac with the two ventral aortic branches ramifying on wall of yolk sac.

FIG. 343.—A later stage than *Fig. 342*. The two vitelline arteries taking origin from aorta.

It is interesting to consider briefly the development of this condition. In the embryo, the vitelline arteries arise as two ventral aortic branches, which ramify in the wall of the yolk sac (*Figs. 342, 343*). These vessels then fuse to form a short common trunk, which later becomes the superior mesenteric artery. One of the ventral aortic branches persists as the definite vitelline artery, and proceeds round the gut wall along the vitelline duct to the yolk sac (*Fig. 344*). Later, when the intestines are entirely within the abdomen, the vitelline duct ceases to exist, and the vitelline artery is stretched to a filamentous strand, so that it normally ruptures and disappears. In this case, however, the artery had persisted, and the tension caused it to be pulled away from the gut wall, so that the artery emerged from the peritoneum at its junction with the superior mesenteric artery without being adherent in any way to the wall of the bowel.

Fig. 345 shows diagrammatically the anatomical relations in the present case. The fibrous cord must have been under tension at the time of the operation, as the small amount of pull on the tumour was sufficient to rupture the small branch at the junction.

Discussion.—No similar case has been found in the literature. The occasional persistence of vitelline arteries was known to Meckel, who says "that in man as well as in animals, the remains of the vitelline canal disappear earlier from the intestine than from the vascular systems". He also quotes a case where, in a child of three months, he found a persistent vitelline artery arising from the superior mesenteric artery, and proceeding along the entire length of a Meckel's diverticulum, and which was "converted at its end into a solid thread several inches long, and hanging free."

Spangenburg found in a young man twenty years of age a persistent vitelline vein, which was patent from the mesenteric vessel for half its length.

FIG. 341.—The two vitelline arteries have fused to form the superior mesenteric artery (S.M.A.). The right artery below the junction has disappeared, the left (P.V.A.) runs along the vitelline duct to the yolk sac. At this stage it is close to the gut wall, and under the peritoneum.

FIG. 345.—The condition existing in the described case. The relation of the peritoneum is shown by the dotted line. The persistent artery (P.V.A.) is connected with the anterior abdominal wall and with the superior mesenteric artery. The small ruptured branch is shown at R.A.

Eschricht records a fatal case of strangulation of the bowel in an old woman, due to a persistent omphalo-mesenteric vessel. The importance of these persistent vessels in causing strangulation has been emphasized by Falk, Schroeder, and Leichtenstein, who quote cases.

A comprehensive account of persistent omphalo-mesenteric remains is given by Fitz,¹ from whom the above references are quoted.

Our thanks are due to Professor Arthur Robinson for assistance in connection with the developmental aspects of the case.

REFERENCE.

- ¹ FITZ, *Amer. Med. Journal*, 1884, lxxxviii, 30.