

ACCESSORY ENTERIC FORMATIONS

A CLASSIFICATION AND NOMENCLATURE

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There is considerable confusion in the present classification and nomenclature of accessory enteric formations—enterogenous cyst, archenteric cyst, gastro-thoracic cyst, duplication, etc. The purpose of this paper is to present a practical classification founded on the basic embryological deviations and a systematic nomenclature. Many of the anomalies are of some rarity and few surgeons are likely to acquire a series of any great size. The frequency of diagnosis should increase with an awareness of the types and the use of a common terminology.

The proposed classification is:

1. Duplications
2. Vitelline remnants
3. Dorsal enteric remnants

All have a typical enteric structure of smooth muscle and epithelial lining, not necessarily that of gut, to which it lies adjacent or from which it originates. In the third group the structure may be not of gut but of a gut derivative.

Classification

1. Duplications. This term should be restricted to these formations, either tubular or spherical, which lie in contiguity with normal bowel and which share with it a common blood supply and usually a common muscle coat. There may or may not be communication between the normal and anomalous lumina, and the dividing septum may be muscular or merely a double layer of epithelium.

During early foetal life, embryo and gut grow at a similar rate, a rate which soon becomes inadequate for the latter if the necessary absorptive area is to be provided. Accordingly, the rate of growth of the gut accelerates with thickening of the epithelial lining and obliteration of the lumen and subsequent recanalization by the coalescence of vacuoles which appear within the epithelium (Johnson, 1910). Coalescence of an additional group of vacuoles, which fail to rupture into the normal lumen, causes the formation of duplications, spherical or tubular, depending on the length of bowel affected.

2. Vitelline Remnants. Remnants of vitello-intestinal origin are included in the classification because firstly they are accessory enteric formations, secondly there are aetiological similarities to dorsal fistula, and thirdly there is a similarity in the two groups of remnants found after birth. There is little justification other than usage for perpetuating the present names of Meckel's diverticulum, enterocystoma, enteroteratoma, raspberry tumour, etc.

Such remnants represent failure of closure of the vitello-intestinal duct. The mid-gut is in free communication with the definitive yolk-sac until the late pre-somite stage when the communication narrows to form the vitello-intestinal duct which in turn disappears by the end of the sixth week of foetal life. Incomplete obliteration gives rise to the anomalies shown in Fig. 1, which I suggest be called vitelline fistula, sinus, cyst and diverticulum. Similarly, I propose that an obliterated vitelline artery be called a vitelline cord.

3. Dorsal Fistula Remnants. During the second half of the nineteenth century, it was shown experimentally that sagittal clefts could be produced in frog and pike embryos with dorsal protrusion of the yolk-sac (Lereboullet, 1863; Roux, 1888; Hertwig, 1892). Bremer (1952) has suggested a similar occurrence during early human development with rupture of the yolk-sac herniation and formation of a fistula between yolk-sac and amniotic cavities, while Saunders (1943) and McLetchie, Purves and Saunders (1954) have postulated that a cleft notochord leads to adhesion of yolk-sac endoderm to ectoderm with subsequent erosion and fistula formation. However, during that phase of normal development when the notochord becomes intercalated in yolk-sac endoderm, openings appear in the floor of the notochord canal, thus establishing temporary communication between yolk-sac and amniotic cavities. Whatever the precise mechanism, it must be assumed that at some phase of pre-somite development such a fistula occurs. The development and obliteration of the vitello-intestinal duct is

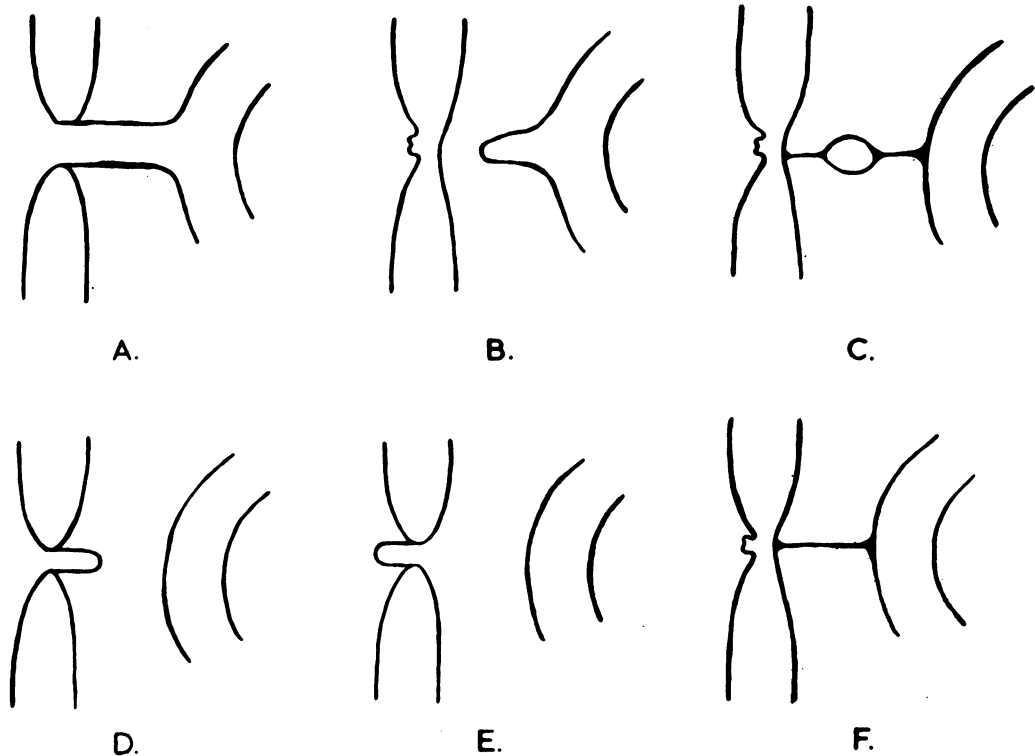


FIG. 1.—A. Vitelline fistula; B. vitelline diverticulum; C. vitelline cyst; D. vitelline sinus; E. prolapsed vitelline sinus; F. vitelline cord.

TABLE I
PRESENT AND REVISED NOMENCLATURE

Group	Present Nomenclature	Revised Nomenclature
Duplication	Duplication Ileum duplex Enterogenous cyst, etc.	Duplication: Tubular Spherical
Vitelline remnants	1. Patent vitello-intestinal duct Umbilical fistula 2. Enteroteratoma Umbilical polyp Etc. 3. Enterocystoma 4. Meckel's diverticulum 5. Omphalo-mesenteric cord	1. Vitelline fistula 2. Vitelline sinus 3. Vitelline cyst 4. Vitelline diverticulum 5. Vitelline cord
Dorsal enteric remnants	1. Accessory neurenteric canal 2. 3. Mediastinal enterocystoma Gastric thoracic cyst Archenteric cyst Etc. 4. Giant diverticulum Macrodiverticulum Congenital diverticulum	1. Congenital dorsal enteric fistula 2. Congenital dorsal enteric sinus 3. Congenital dorsal enteric cyst (a) Prevertebral (b) Postvertebral (c) Intraspinal 4. Congenital dorsal enteric diverticulum

part of normal human development, and, since it traverses a cavity, its obliteration is an isolated process. The occurrence of a dorsal enteric fistula is abnormal, hence less common, and, since it traverses spine to reach the dorsal surface, not only has the fistula to be obliterated but the vertebral and neural defects have to be repaired. The various enteric, neural, and vertebral defects persisting after birth represent the varying degrees of success attained. Elongation of the gut during foetal life leads to wide separation of the original spinal and enteric regions, hence the association of cervical and thoracic spinal anomalies with caudad enteric lesions.

Analogous with vitello-intestinal remnants one may find (Fig. 2):

(1) Congenital dorsal enteric fistula when the whole tract persists and presents as a fistula passing from gut through spine and cord to open on the midline posteriorly.

(2) Congenital dorsal enteric sinus when only the posterior part persists.

(3) Congenital dorsal enteric cyst when an inter-

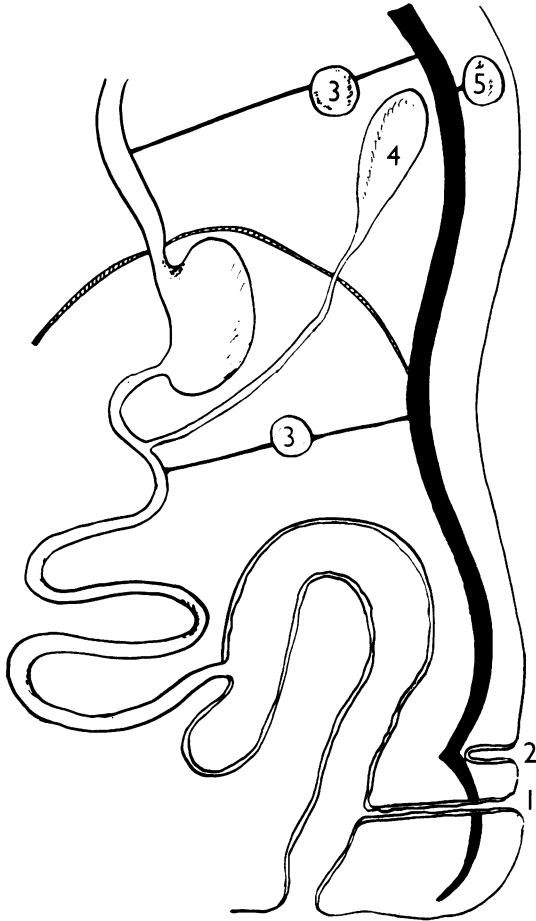


FIG. 2.—1. Dorsal enteric fistula; 2. Dorsal enteric sinus; 3. Dorsal enteric cyst; 4. Dorsal enteric diverticulum; 5. Dorsal enteric cyst.

mediate part persists. The cyst may be pre- or post-vertebral or intraspinal in position, and may have fibrous attachments to gut or spine.

(4) Congenital dorsal enteric diverticulum when only the anterior part persists and connexion with the lumen of the gut is maintained.

There may be varying degrees of concomitant vertebral abnormality with diastematomyelia or diplomyelia. This aspect is discussed more fully in another communication (Bentley and Smith, 1960).

Summary

A classification and nomenclature of accessory enteric formations is proposed which should end the present confusion and facilitate the recognition of the less common types.

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