CASE REPORT

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The Completeness of the Afterbirth: A Medical/Pathological Discussion

REFERENCE: Kasznica, J., Kessler, S., and Abramowitz, A., **"The Completeness of the Afterbirth: A Medical/Pathological Discussion,"** *Journal of Forensic Sciences*, JFSCA, Vol. 36, No. 4, July 1991, pp. 1251–1255.

ABSTRACT: Practical problems (with possible medicolegal implications) regarding the interpretation of the completeness of the afterbirth are discussed. The case material was obtained during surgical pathological examination and, later, at the time of autopsy of the same patient. The mother (three weeks following emergency delivery) succumbed to life-threatening complications of an epidural anesthetic accident.

KEYWORDS: pathology and biology, afterbirth, completeness of the placenta, placental disc, membranes, placenta membranacea, placenta accreta

When a pathologist describes a "placenta," the state of the maternal surface is routinely mentioned, especially regarding its "completeness." This is a widely accepted practice.

Using this interesting case as an example, the authors attempt to analyze the importance of such a statement, and just how much and what could be said by the examiner. The consequences of such a statement may have serious medicolegal implications, and in this paper, we try to dispel popular misconceptions harbored by many pathologists (including medical examiners) and obstetricians about the so-called "completeness of the placenta."

Report of the Case

A 17-year-old black female was admitted to Boston City Hospital, Boston, Massachusetts, with spontaneous rupture of membranes at 41 weeks of pregnancy. Because of complications from epidural anesthesia, a situation arose in which an emergency cesarean section needed to be performed. The mother died three weeks later, after multiple cardiac arrests and unexplained sepsis despite antibiotic treatment.

At the time of autopsy, the positive findings included anatomic evidence of a "respirator

Received for publication 18 Sept. 1990; accepted for publication 11 Oct. 1990.

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brain" consistent with clinical anoxic encephalopathy (the patient was comatose and on a respirator for approximately 20 days), anatomic predisposition to complicated intubation (specifically, the patient had a short thick neck and obesity), and histological evidence in the various organs supporting the clinical diagnosis of sepsis (spleen and kidneys with multiple subcapsular septic infarcts; gangrenous infarcts of lung tissue; and cardiac, probably septic, valvular vegetations). There were also changes in the lungs related to prolonged mechanical respiratory support and oxygen, including diffuse alveolar damage and fibrosis.

Upon opening of the uterus, there appeared to be retained placental membranous components and hematomas adherent to the anterior wall of the uterus (Fig. 1). Microscopically, the presence of membranes, a few underlying ghost villi, decidua, and hemorrhagic, necrotic, and purulent tissue was found to correspond with the gross findings (Figs. 2 and 3). Additional microscopic findings showed multiple myometrial abscesses with much necrosis. Therefore, retained products were believed to be the probable cause of, or at least a contributing factor to, the purulent endomyometritis which resulted in sepsis. However, after exhaustive search, no actual placental parenchymal cotyledons were found. The microscopic findings of chorionic tissue seemed inconsistent with the apparent completeness of the placental disc as reported in the surgical gross report, or was it?

Discussion

In routine study of the afterbirth (placenta, membranes, and cord), one speaks almost anecdotally of the placenta as being complete or incomplete. We feel that this is an oversimplification, which may lead to a misunderstanding of the problem. This problem should be more thoroughly analyzed, especially from a medicolegal standpoint, since the infectious and hemorrhagic consequences of retained products may potentially have serious medical sequelae, including death. The issue of postpartum sepsis, including a very detailed autopsy study of the pathologic anatomy of puerperal catastrophes was described

FIG. 1—*Gross photograph of the opened postpartum uterus with clearly evident polypoid structures on the lumenal (endometrial) aspect. The narrow portion represents the rugated opened endocervical canal.*

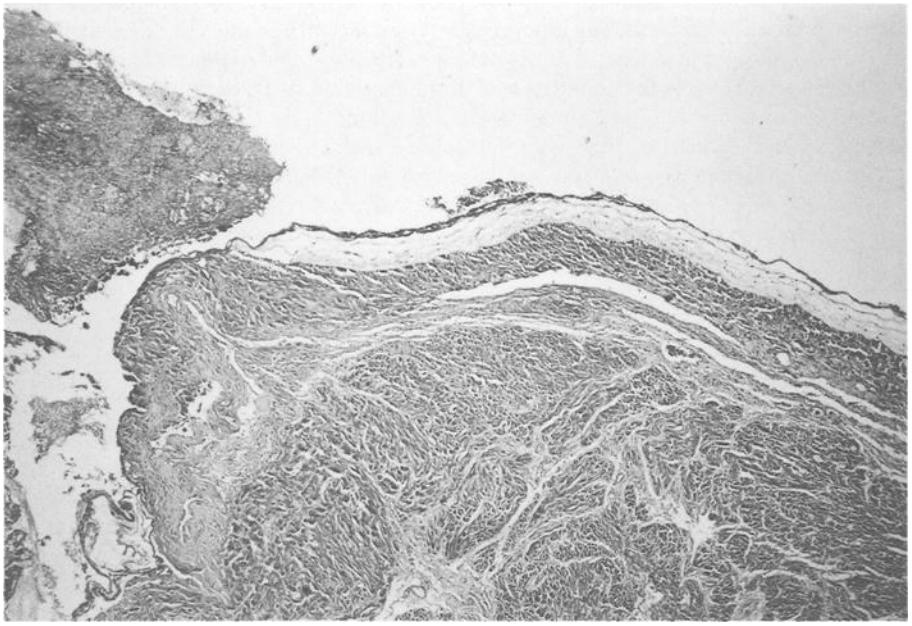

FIG. 2—*Low-power microscopic view showing adherent membranes (amnion clearly visible) attached to underlying fibrin, blood, and partly necrotic endometrium/myometrium (hematoxylin and eosin stain; magnification, ×40).*

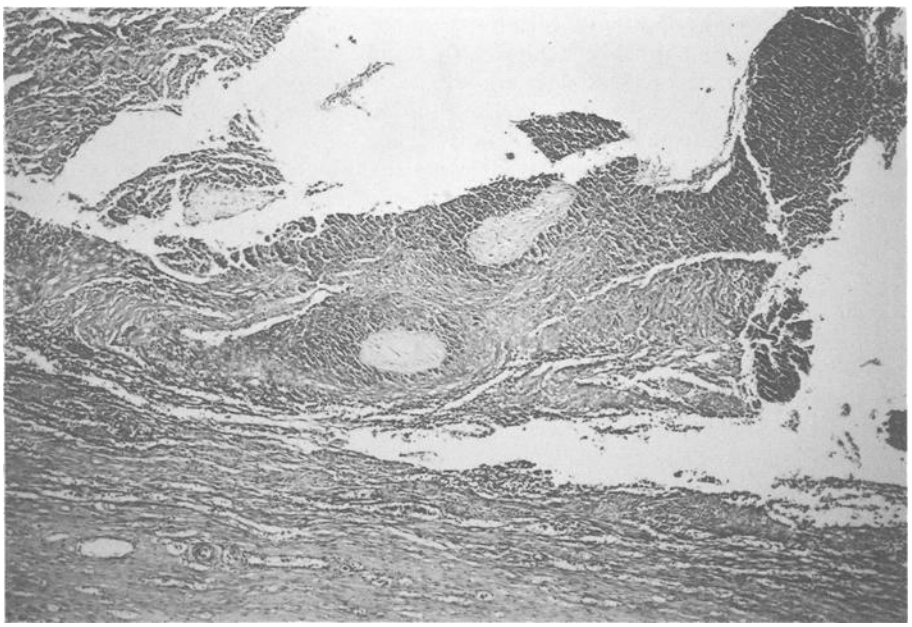

FIG. 3—*Low-power microscopic view showing three "ghost" villi entrapped in fibrino-hemorrhagic meshwork. No fetal membranes are seen in this photograph (hematoxylin and eosin stain; magnification, ×40).*

in the classic European pathological work published in 1919 [*1*]. Medicolegal indications for placental study are assuming an ever-greater importance in obstetric practice [*2*]. We shall first consider just what "completeness" means? "Completeness" in the above-mentioned sense means the completeness of the maternal surface (floor) of the placental disc *actually examined* [*3*]. We already see a limitation of this definition of completeness. Let us give two scenarios. First, suppose there is more than one disc (one of which is left behind in the uterus, as a retained accessory lobe). Second, suppose that the membranes themselves are not complete. Surely the examination of the given disc would not be very helpful in resolving the above problems. Therefore, we propose that a distinction be made between the completeness of the placental disc and the completeness of the entire afterbirth. To make matters even more complicated, if the partly sloughed off and necrotic decidua is not entirely expelled as lochia, is this classified as part of a retained afterbirth (though, admittedly, it is of maternal and not fetal origin)?

The problem of the retained accessory lobe can usually be resolved by flipping the placenta on the other side so that the fetal surface is clearly seen (facing upward). If there are grossly evident chorionic plate vessels severed at the membranous margin (and the insertion of the umbilical cord is defined), then it is reasonable to assume that an accessory lobe or lobes have been left behind in the uterus. White dye or radiopaque dye injection studies of the chorionic plate vessels are invaluable in this regard [*2*]. Dye leakage is detected at the site of the torn vessels at the disc margin. (Milk or nondairy creamer may be used as a suitable substitute for white dye.)

The other possibility for a wrong conclusion due to missed discs is multiple gestations, especially small retained placental discs of a fetus compresses/papyraceus type.

Finally, probably the most interesting situation arises in varying degrees or severities of placenta membranacea (diffusa). This type of placenta is very rare in humans, but is the usual type found in the pig, mare, donkey, and elephant. From studying the literature it is clear that there is a spectrum which ranges from a very rare, almost true "membranous" diffuse chorion frondosum type of placenta, to a flattened "spreading" type (with attenuated irregular borders), to islands of a nummular type of chorion, all the way to a well-defined placental disc combined with peripheral or isolated shaggy villous-like areas [*3–5*]. In the last type of case, at the time of gross examination, the disc may be evaluated by the pathologist as complete, and yet, theoretically, there may well be retained membranes with decidua anchored by "ghost-like" or well-preserved villi. The abnormality of placental/membranous adherance to the uterus likewise cannot be ignored; placenta accreta is notoriously difficult to demonstrate on the passed afterbirth specimen, because smooth muscle cells of the uterus must be documented on the maternal aspect [*3*]. In general, placenta accreta, increta, or percreta must be documented on a complete hysterectomy specimen, which contains in situ placental villi and trophoblast. In rolls of free membranes from routine placentas, it is not uncommon to find ghost villi or sometimes viable-appearing villi, which may be remnants left over from the chorion frondosum stage of development (Fig. 4). These villi are not commonly vascularized, in contrast to a true membranous or diffuse placenta [*5,6*]. Membrane completeness itself, on the other hand, is virtually impossible to ascertain, especially on fixed specimens or in situations where prior handling may result in tearing of the membrane. This type of clinical problem, however, should be generally preventable in situations in which a cesarean section is performed when there is an opportunity for visual inspection of the exposed inside aspect of the uterus, which does not normally present itself following vaginal delivery (except pathologically in complete uterine inversion).

In other words, when the maternal surface of the disc is stated to be complete, this is not equivalent to actual completeness of the afterbirth (with all its maternal/fetal clinicopathological and legal implications and consequences). However, if the maternal surface is found to be missing placental lobes or parts thereof, it is the pathologist's positive

FIG. 4—*Low-power view of "free membrane" roll of routine placenta showing a row of "ghost" villi (remnants of chorion frondosum) sandwiched in between partly necrotic amnion/chorion and decidua (lower membrane) (hematoxylin and eosin stain; magnification, ×40).*

statement signaling the above impression that has both diagnostic and descriptive value for the patient and her obstetrician.

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