

Case for slide seminar at PPS, Helsinki 2008.

Sent by Lisa Leth Maroun, Denmark.

Clinical summary:

23-year old mother, first pregnancy. Admitted at 30 weeks of gestational age due to fetal hydrops. At sonography signs of anemia, ascites and bilateral hydrothorax. At chordocenteses fetal hemoglobin 1.6 mM. Intrauterine blood transfusion performed, but abnormal middle cerebral artery flow persisted. Cesarean section was performed two days after admission. Hemoglobin at birth 4.7. On flow cytometric examination of maternal blood with anti-HbF an amount of 2.7% fetal red blood cells were found corresponding to a volume of 120 ml fetal whole blood.

Pathological examination:

The placenta was of normal size, grossly unremarkable fetal and maternal surface. On cut section a number of subchorionic and intraplacental hemorrhages were noted. Histologically several intraplacental and subchorionic hematomas of varying ages and varying sizes were noted.

Diagnosis:

Feto-maternal hemorrhage.

Differential diagnosis and discussion:

Feto-maternal hemorrhage (FMH) is not a pathological but merely a clinical diagnosis, usually confirmed and quantified either by automated Kleihauer-Betke test or by flow cytometric examination of maternal blood.

The entrance of small amounts of fetal blood cells into the maternal circulation occurs in most pregnancies and is usually asymptomatic. The survival of the fetal blood cells depends on blood group compatibility between mother and fetus. In compatible cases FMH may be detected by flow cytometry up to 3 months after birth. The incidence of significant FMH (> 30 ml of fetal blood) is 3/1000 pregnant women. Massive FMH (> 100 ml) was in one study (1999, Samadi) found to be responsible for 4,4 % of intrauterine fetal deaths. FMH may be acute or chronic. Sometimes chronic or recurrent FMH is the cause of hydrops due to fetal anemia, which may be exacerbated by hemolysis of fetal blood cells due to immunization of the mother against fetal alloantigens induced by the maternal chimerism. These fetuses may be treated successfully by repeated intrauterine blood transfusions.

The placental examination in these cases may identify villous edema, nucleated red blood cells in the intervillous space and/or placental hematomas, which extension and duration may be estimated. Sometimes the cause of the hemorrhage may be documented. Some of the causes of FMH are: Abruption, placental vascular malformation (chorangioma), intraplacental choriocarcinoma, trauma (maternal trauma or intrauterine chordocenteses), umbilical vein thrombosis, thrombophilia, and prothrombin gene mutation.

Most intraplacental hematomas appear at the site of a leak in the fetal circulation. Due to a positive pressure gradient fetal blood spills over into the maternal blood space and the maternal blood forms an expanding clot. Grossly hematomas may be indistinguishable from other indurated areas such as recent infarcts and vascular tumor, which can be very difficult to appreciate on gross examination. Histologically a single nodular lesion of capillaries and intervening stromal cells surrounded by trophoblast characterizes chorangiomas. It should be differentiated from localized and diffuse chorangiomatosis, which shows similar histology, but involves multiple large stem villi. The amount of accompanying stroma may vary and the lesions may show significant trophoblastic hyperplasia.

The above-mentioned benign lesions must be differentiated from the intraplacental choriocarcinoma, a malignant tumor with potential to metastasize to both mother and fetus. It is diagnosed by the histological finding of atypical biphasic tumorous tissue consisting of atypical trophoblast and syncytiotrophoblast cells growing out from stem villi and sharply demarcated from the surrounding normal placental tissue.

Fetomaternal hemorrhage is a rare but important cause of hydrops fetalis and intrauterine fetal death. The pathological findings are usually subtle and testing of the maternal blood for FMH should be part of the clinical evaluation of fetal hydrops, fetal anemia, and fetal demise of unknown etiology.

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