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**FALLOPIAN TUBES**

**Salpingitis**is inflammations of the tube and is almost always microbial in origin. With the declining incidence of gonorrhea, nongonococcal organisms, such as *Chlamydia, Mycoplasma hominis,* *coliforms*, and (in the postpartum setting) *streptococci and staphylococci*, are now the major offenders. Compared to gonococci, the nongonococcal infections differ in that they are more invasive, penetrating the wall of the tubes and thus tend more often to give rise to blood-borne infections and seeding of the meninges, joint spaces, and sometimes the heart valves. *Tuberculous salpingitis* is far less common and is encountered *almost always in combination with tuberculosis of the endometrium.*

All forms of salpingitis may produce pelvic masses when the tubes become distended with either exudate or, later, burned-out inflammatory debris and secretions. Adherence of the tube to the ovary and adjacent ligamentous tissues results in a *tubo-ovarian abscess,* or when infection subsides, a *tubo-ovarian complex*. Even more serious is the potential for adhesions that increases the risk of*tubal ectopic pregnancy*. Damage or obstruction of the tubal lumina may produce permanent sterility.

**Tubal pregnancy**

**Primary adenocarcinomas** of the fallopian tubes may be of papillary serous or endometrioid histology and frequently involve the omentum and peritoneal cavity at presentation.

**DISEASES OF PREGNANCY**

**Placental Inflammations and Infections**

Infections reach the placenta either as an ascending infection through the birth canal (the most common) or through hematogenous route (transplacental infection).

***Ascending infections*** are mostly bacterial and are complicated by premature rupture of the membranes that eventuates in premature birth. The chorioamnion shows neutrophilic infiltration with edema and congestion (*acute chorioamnionitis*). Extension of the infection may involve the umbilical cord and placental villi and cause *acute vasculitis of the cord****.*** In hematogenous spread of bacteria and other organisms the villi are most often affected (*villitis*).

**Ectopic Pregnancy** refers toimplantation of the fertilized ovum in any site other than the normal uterine location. It occurs in 1% of pregnancies. In more than 90% it is a tubal pregnancy; other sites include the ovaries & abdominal cavity. Any factor that retards passage of the ovum along its course through the tube to the uterus predisposes to an ectopic pregnancy. *In about half of the cases, such obstruction is a complication of chronic salpingiti****s****, although intrauterine tumors & endometriosis may also impede passage of the ovum*. In approximately 50% of tubal pregnancies, no anatomic cause can be demonstrated. Ectopic pregnancies are characterized by a normal early development of the embryo, with the formation of placental tissue, the amniotic sac, and decidual changes. With tubal pregnancies, however, the invading placenta eventually burrows through the wall, causing *intratubal hematoma (hematosalpinx), intraperitoneal hemorrhage*, or both. The tube is usually locally distended (up to 4 cm in diameter) by a contained mass of freshly clotted blood in which may be seen bits of gray placental tissue and fetal parts. *The histologic diagnosis depends on the visualization of placental villi or, rarely, of the embryo*. Until rupture occurs, an ectopic pregnancy may be indistinguishable from a normal one, with cessation of menstruation and elevation of serum and urinary placental hormones. Under the influence of these hormones, the endometrium (in 50% of cases) undergoes the characteristic hypersecretory and decidual changes. However, the absence of elevated gonadotropin levels does not exclude this diagnosis, because poor attachment with necrosis of the placenta is common. Rupture of an ectopic pregnancy may be catastrophic, with the sudden onset of intense abdominal pain and signs of an acute abdomen, often followed by shock. Prompt surgical intervention is necessary.

**Gestational Trophoblastic Tumors**

Theseare divided into four morphologic categories:

*1. Hydatidiform mole*

*a. Complete*

*b. Incomplete*

*2. Invasive mole*

*3. Choriocarcinoma.*

*4. Placental site trophoblastic tumor*

All the three produce human chorionic gonadotropin (hCG), which can be detected in the circulating blood and urine, at much higher titers than those found during normal pregnancy. The titers are progressively rising from hydatidiform mole to invasive mole to choriocarcinoma. In addition to aiding diagnosis, the fall or rise in the level of the hormone in the blood or urine can be used to monitor the effectiveness of treatment. Clinicians therefore prefer to lump the three conditions under the heading of *gestational trophoblastic disease,* because the response to therapy as judged by the hormone titers is more important than any arbitrary anatomic segregation of one lesion from another.

**1. Hydatidiform Mole: Complete and Partial**

The typical hydatidiform mole is a large mass of swollen chorionic villi, appearing grossly as grapelike structures. The swollen villi are covered by varying amounts of sometimes highly atypical chorionic epithelium. Two distinctive subtypes of moles have been characterized: *complete* and *partial* moles.

*A.* ***The complete hydatidiform mole*** does not permit embryogenesis and thus does not contain fetal parts. All of the chorionic villi are abnormal, and the chorionic epithelial cells are diploid (46, XX or, uncommonly, 46, XY).

*B.* ***The partial hydatidiform mole*** permits early embryogenesis and therefore contains fetal parts, has some normal chorionic villi, and is almost always triploid (e.g., 69, XXY).

The two patterns result from abnormal fertilization; in both two spermatozoa fertlize an ovum; in a complete mole an empty egg is fertilized, which yields a diploid karyotype composed of entirely paternal genes, while in a partial mole a normal egg is fertilized, resulting in a triploid karyotype with a preponderance of paternal genes.

For unknown reasons there is a much higher incidence of complete moles in Asian countries. Moles are most common before the age of 20 years and after the age 40 years, and a history of the condition increases the risk in subsequent pregnancies. Although traditionally discovered around week 12 of pregnancy because of a gestation that was "too large for dates," early monitoring of pregnancies by ultrasound has lowered the gestational age of detection, leading to the *more frequent diagnosis of "early complete hydatidiform mole*." In either instance, elevations of hCG in the maternal blood and absence of fetal parts or fetal heart sounds are typical.

***Gross features***

* In fully developed cases of ***complete moles*** the uterine cavity is filled with a delicate, friable mass of thin-walled, translucent cystic structures .
* Fetal parts are rarely seen in complete moles but are common in partial moles. In the latter only some but not all of the villi are swollen.

***Microscopic features***

***The complete mole***

* There is hydropic swelling of all the chorionic villi, which are avascular.
* The central substance of the villi is a loose, edematous stroma.
* The chorionic epithelium almost always shows some degree of proliferation of both cytotrophoblast and syncytiotrophoblast . The proliferation may be mild, but in many cases there is striking circumferential hyperplasia.

***Partial moles***

* The villous edematous swelling involves only some of the villi and the trophoblastic proliferation is focal and slight.
* The villi of partial moles have a characteristic irregular scalloped margin.
* In most cases of partial mole there is evidence of an embryo or fetus. This may be in the form of fetal red blood cells in placental villi or, in some cases, a fully formed fetus that, despite a triploid karyotype, is morphologically nearly normal in appearance.

Overall, 80% to 90% of moles do not recur after thorough curettage; *10% of complete moles are invasive,* but not more than 2% give rise to choriocarcinoma. Partial moles rarely give rise to choriocarcinomas. With complete moles, monitoring the post-curettage blood and urinary hCG concentrations, particularly the more definitive β-subunit of the hormone, permits detection of incomplete removal or a more ominous complication and leads to the institution of appropriate therapy, including in some cases chemotherapy, which is almost always curative.

**2. Invasive Mole** is a complete mole that is more invasive locally but do not have the metastatic potential of a choriocarcinoma.An invasive mole retains hydropic villi, which penetrate the uterine wall deeply, possibly causing rupture and sometimes life-threatening hemorrhage. Local spread to the broad ligament and vagina may also occur. ***Microscopically,*** the epithelium of the villi is hyperplastic and atypical.*Metastases do not occur but hydropic villi may embolize to distant organs, such as lungs or brain.* However, these emboli are not metastatic and may regress spontaneously. Because of the greater depth of invasion into the myometrium, an invasive mole is difficult to remove completely by curettage, and therefore serum hCG may remain elevated. In most cases cure is possible through chemotherapy.

**3. Choriocarcinoma** is a very aggressive malignant tumor arises either from gestational chorionic epithelium or, less frequently, from totipotential cells within the gonads or elsewhere. They are much more common in Asian and African countries, reaching a frequency of 1 in 2000 pregnancies. The risk is somewhat greater before age 20 and is significantly elevated after age 40. Approximately 50% of choriocarcinomas complicate complete hyaditidiform moles; about 25% arise after an abortion, and most of the remainder occur during what had been a normal pregnancy. Most cases are discovered by the appearance of a bloody or brownish discharge accompanied by a rising titer of hCG, particularly the β-subunit, in blood and urine, and the absence of marked uterine enlargement, such as would be anticipated with a mole. In general, the titers are much higher than those associated with a mole.

***Gross features***

* The tumor appears as very hemorrhagic, soft, nodular, necrotic masses within the uterus.
* Some times the primary lesion may self-destruct, and only the metastases tell the story.
* Very early, the tumor insinuates itself into the myometrium and into vessels.

***Microscopic features***

* Cytotrophblastic cells tend to grow in clusters and sheets, separated by streaming masses of syncytiotrophoblast, forming the characteristic dimorphic growth pattern of mononucleate cytotrophoblast and syncytiotrophoblast.
* Hemorrhage and necrosis are usually present.
* In contrast to the case with hydatidiform moles and invasive moles, chorionic villi are not formed.

By the time most choriocarcinomas are discovered, there is usually widespread dissemination via the blood, most often to the lungs, vagina, brain, liver, and kidneys. Lymphatic invasion is uncommon. Despite the extreme aggressiveness of these neoplasms, which made them nearly uniformly fatal in the past, present-day chemotherapy has achieved nearly 100% cure. By contrast, there is relatively poor response to chemotherapy in choriocarcinomas that arise in the gonads (ovary or testis). This striking difference in prognosis may be related to the presence of paternal antigens on placental choriocarcinomas but not on gonadal lesions. Conceivably, a maternal immune response against the foreign (paternal) antigens helps by acting as an adjunct to chemotherapy.

**Pre-eclampsia, Eclampsia (Toxemia Of Pregnancy)**

The syndrome of hypertension, proteinuria and edema developing in the third trimester of pregnancy, is referred to as ***preeclampsia.*** This occurs in 5% to 10% of pregnancies, chiefly with first pregnancies in women older than age 35 years. In those severely affected, convulsive *seizures may appear, and the symptom complex is then termed* ***eclampsia***. Full-blown eclampsia may lead to *disseminated intravascular coagulation* *(DIC)*, with all of its widespread ischemic organ injuries, and so eclampsia is potentially fatal.

***Pathogenesis***: a basic underlying feature in all cases is *inadequate maternal blood flow to the placenta* secondary to inadequate development of the spiral arteries of the uteroplacental bed. In the third trimester of normal pregnancy, the musculo-elastic walls of the spiral arteries are replaced by a fibrinous material, permitting them to dilate into wide vascular sinusoids. In preeclampsia and eclampsia, the musculoelastic walls are retained and the channels remain narrow. A decrease in vascular endothelial growth factor (VEGF) and an increase in antiangiogenic factors have been found to predate the onset of preeclampsia.

While the exact basis of vascular abnormalities remains unknown, several consequences ensue:

1. Placental hypoperfusion with an increased predisposition to the development of infarcts

2. Reduced elaboration by the trophoblast of the vasodilators prostacyclin, prostaglandin E2, and nitric oxide, which in normal pregnancies oppose the effects of renin-angiotensin-hence the hypertension of preeclampsia and eclampsia

3. Production by the ischemic placenta of thromboplastic substances such as tissue factor and thromboxane, which probably account for the development of DIC.

***Pathologic features***

***A. Placental changes*** include:

*1. Infarcts***,** which are a feature of normal pregnancy, are much more numerous. However, they may be absent.

*2. Retroplacental hemorrhages* occur in 15% of patients.

*3. Premature aging of the villi*may occur as evidenced by villous edema, hypovascularity, and increased production of syncytial epithelial knots.

*4.* *Acute atherosis of spiral arterioles*: prominent in well-advanced eclampsia & characterized by thickening and fibrinoid necrosis of the vessel wall with focal accumulations of lipid-containing macrophages. Necrosis of these cells releases lipid. Such lesions accentuate the placental ischemia.

***B. Multiorgan changes*** may be present, reflecting the development of DIC. The *kidneys* are basically, shows changes consist of fibrin thrombi within the glomerular capillaries, accompanied by endothelial swelling. Focal glomerulitis may ensue. When numerous glomeruli are affected, blood flow to the cortex is reduced, possibly resulting in *renal cortical necrosis* that may be bilateral and fatal. *Microvascular thrombi are also found in the brain, pituitary, heart, and elsewhere.* They have the potential of producing focal ischemic lesions accompanied by microhemorrhages.

Preeclampsia appears insidiously in the 24th to 25th weeks of gestation, with the development of edema, proteinuria, and rising blood pressure. Should the condition evolve into eclampsia, renal function is impaired, the blood pressure mounts, and convulsions may occur. Prompt therapy early in the course aborts the organ changes, with clearance of all abnormalities promptly after delivery or cesarean section.