In the Name of God

Dr. Faraji , perinatologist

Department of Obstetrics and Gynecology

Shiraz University of Medical Siences

Toxoplasmosis and pregnancy

- Toxoplasma gondii is a ubiquitous protozoan parasite
- acquired during childhood and adolescence
- After infection, the large majority of immunocompetent humans are able to limit spread of parasite and associated tissue damage
- parasite remains in latent form in neural and muscle tissue for the life .
- In immunosuppressed patients the parasite can reactivate and cause disease and transmitted from the mother to the fetus, resulting in congenital toxoplasmosis.(4 percent)

- **The frequency of congenital toxoplasmosis increases with gestational age , but frequency of severe sequel is greater when infection is early in pregnancy.**

Clinical manifestations

- usually asymptomatic.
- symptoms : nonspecific and mild: fever, chills, sweats, headaches, myalgias, pharyngitis, hepatosplenomegaly, and/or a diffuse nonpruritic maculopapular rash.
- A common and more specific symptom is bilateral, symmetrical, nontender cervical adenopathy;
- 20 to 30 percent of patients develop generalized lymphadenopathy.
- Ocular disease (chorioretinitis , posterior uveitis) may occur with acute disease but is more common with reactivation.
- It presents with visual loss or floaters.

Should all pregnant women be screened?

- recommendations of national societies in the United States, Canada, and the United Kingdom against routine universal screening for toxoplasmosis in pregnancy .

- Parts of Europe have taken a different approach; serial screening is performed at monthly, bimonthly, or every three-month intervals throughout pregnancy

Interpretation of screening results

- in asymptomatic pregnant women with screen positive ⇨ whether infection occurred prior to conception or during pregnancy is critical and false-positive tests are common.
- IgM antibodies appear as early as two weeks after infection and may persist for years, while IgG antibodies peak six to eight weeks after infection and then decline over the next two years but remain positive
- recent toxoplasmosis ⇨ when both IgM and IgG seroconversion are documented on serial testing.
- for recent or chronic infection or a false-positive result, ⇨ avidity testing.
- High IgG avidity is a hallmark of chronic infection (>4 months old), but low avidity is not diagnostic of recent infection, as low IgG avidity can persist for years in some women .
- The usefulness of a rising IgG titer for diagnosis of acute infection has never been adequately evaluated

Toxoplasma DX

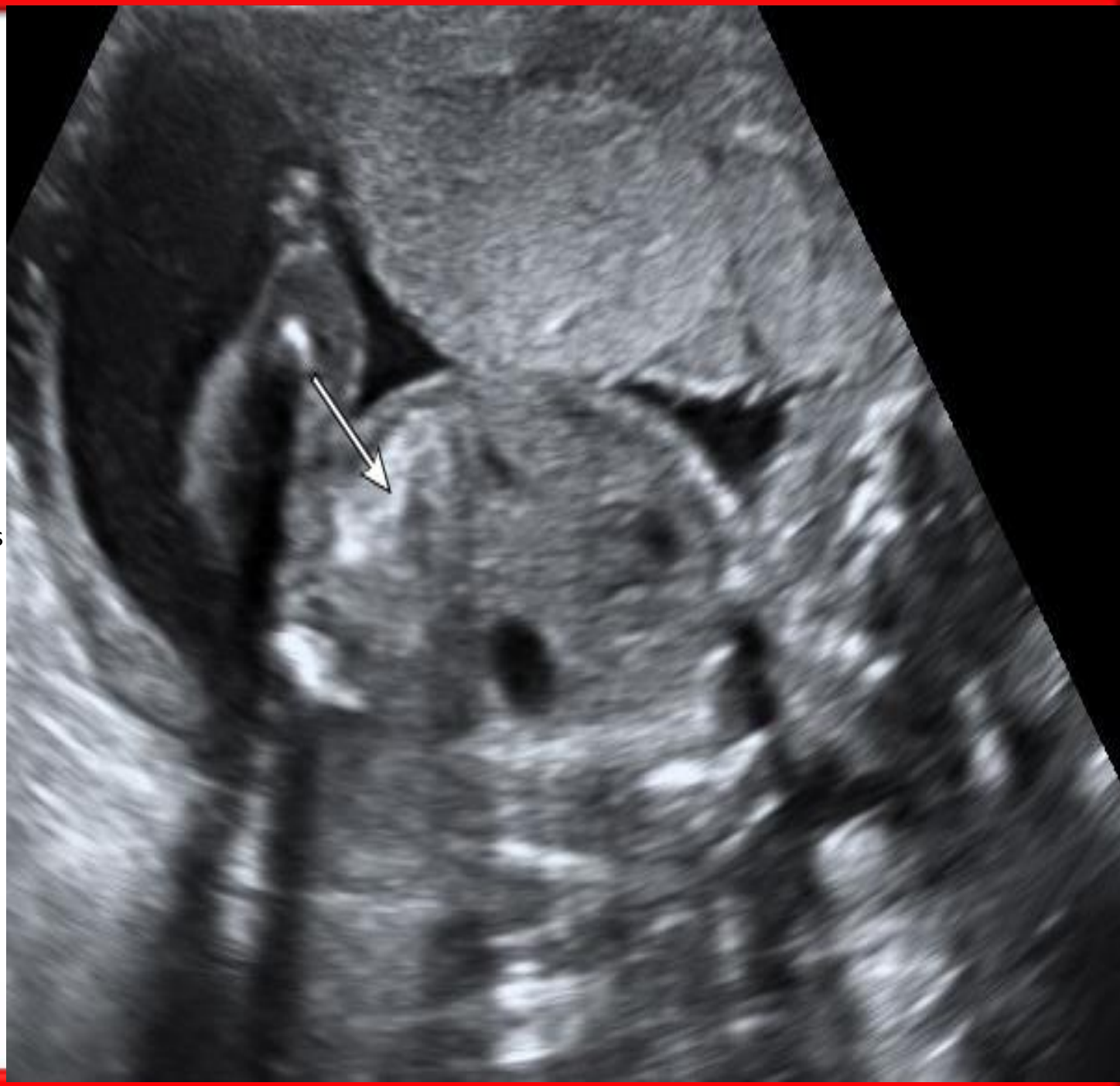
- IgM+, IgG-: Indicative of acute infection especially if IgG become positive thereafter.
- IgM+ , persistent –IgG : false positive IgM (Autoantibodies such as ANA, RF). IgM capture ELISA or IgM ISAGA is needed.
- IgM +, IgG +: usually acute infection. But IgM may persist for few months or years. IgG Avidity test or IgM capture assay or IgM ISAGA is recommended.
- High avidity indicative of infection at least 4 months ago, low avidity usually in less than 4 months and other tests are needed for final decision

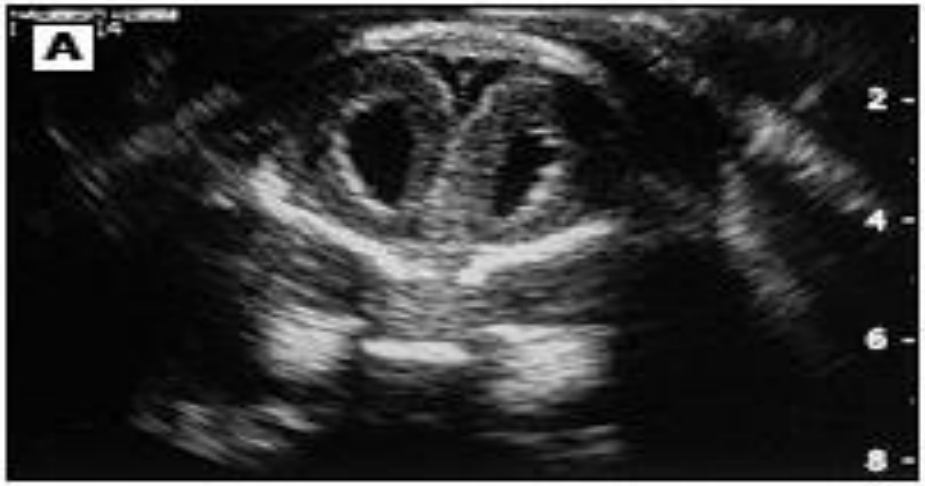
Ultrasound findings in congenital toxoplasmosis

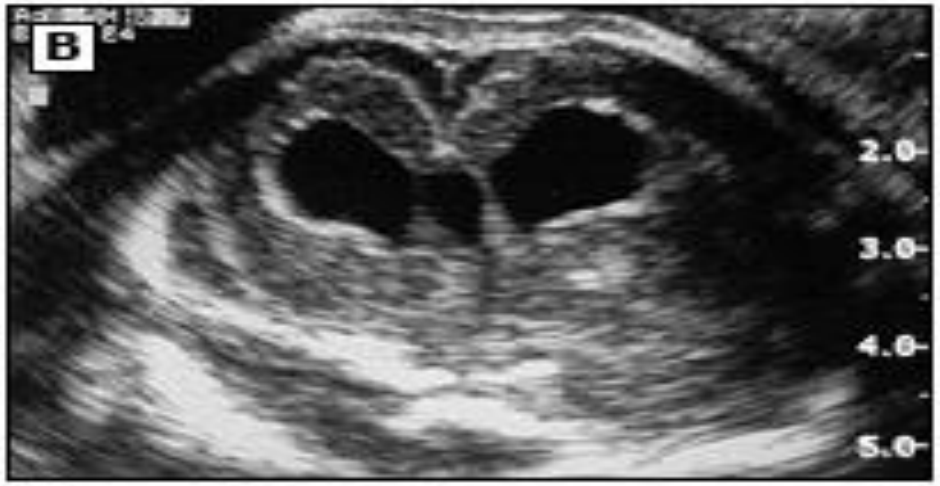
- Intracranial calcifications/densities
- Hydrocephalus
- Echogenic bowel
- Hepatosplenomegaly
- Intrahepatic calcifications/densities
- Intrauterine growth restriction
- Ascites
- Pericardial and/or pleural effusions
- Hydrops fetalis
- Fetal demise
- Placental densities and/or increased thickness

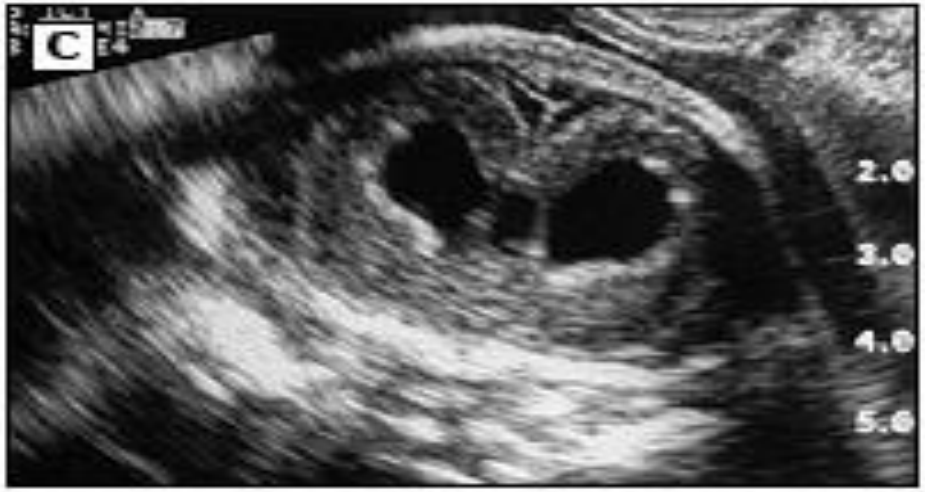
The most common sonographic findings are intracranial hyperechogenic foci or calcifications and cerebral ventricular dilatation, which are poor prognostic signs

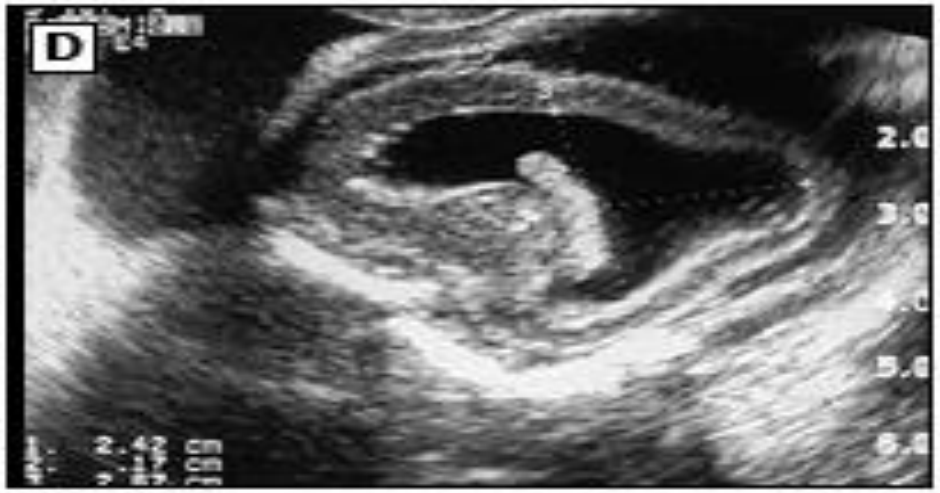
In this longitudinal image, arrow points to a very echogenic portion of fetal bowel that is as echodense as fetal bone.



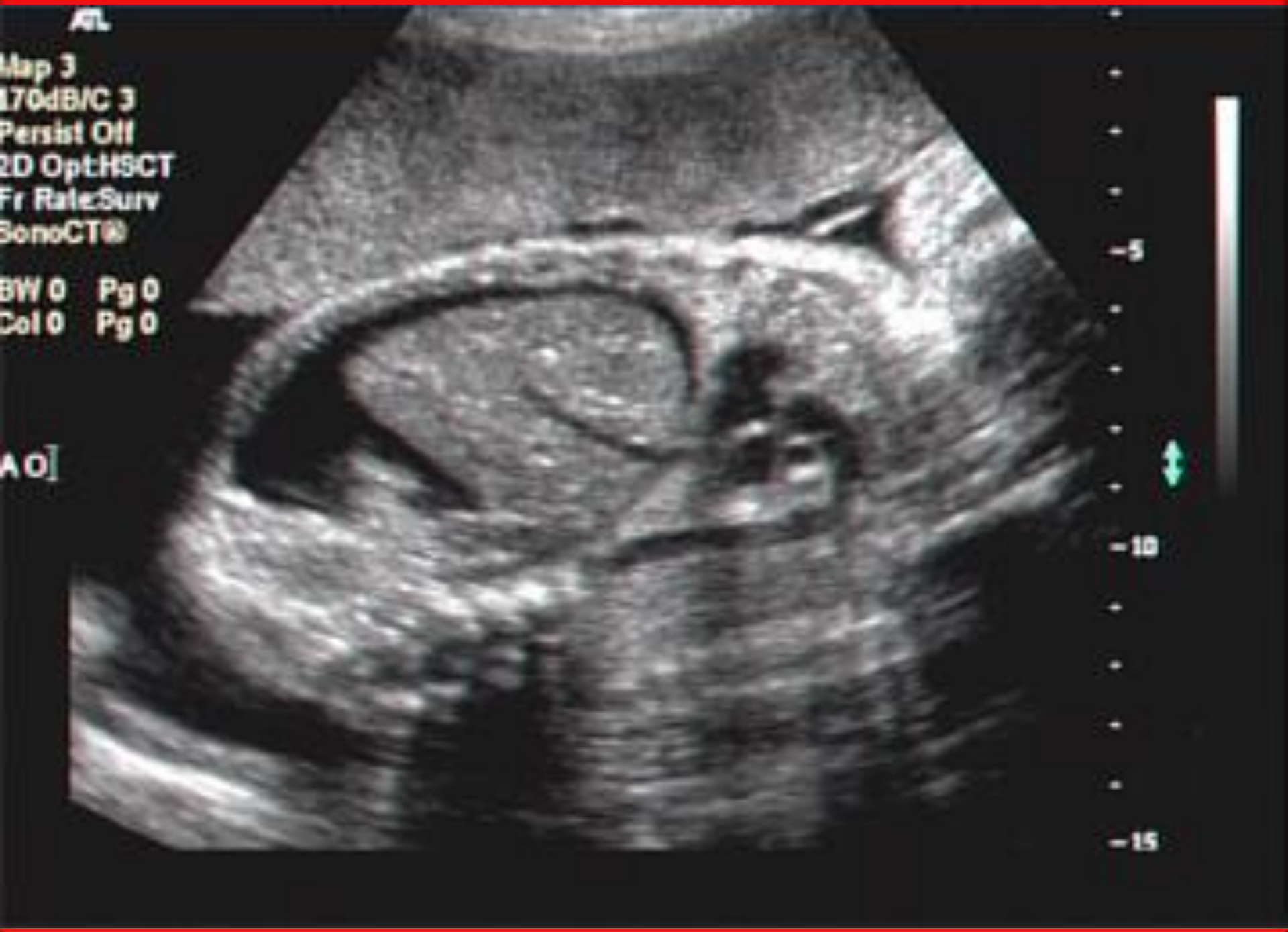








Panels A through C are serial coronal sections from anterior to posterior showing dilation of the lateral ventricles and periventricular calcifications. Panel D is an oblique section showing the dilation of the lateral ventricles, the dysmorphic choroid plexus, and periventricular calcifications.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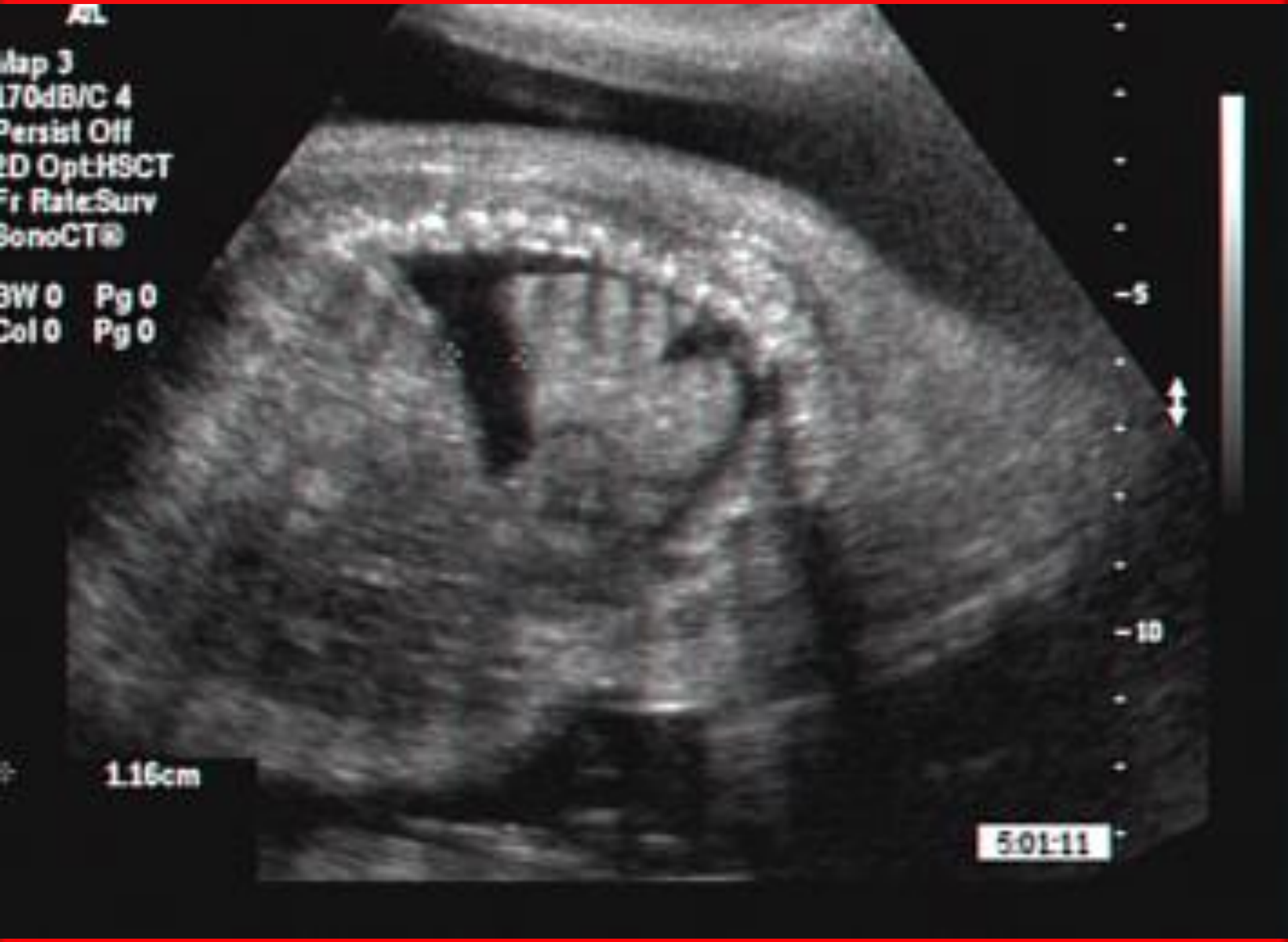
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Prognostic significance

- Not all abnormal fetal findings lead to serious disabling sequelae.

- A European prospective study estimated the probability of serious neurologic sequelae or death for fetuses with abnormal intracranial ultrasound findings was 43 percent

TERMINATION OF PREGNANCY

- Within the prenatal screening program in France, termination is discouraged unless there is definite evidence of fetal infection based on PCR in a reference laboratory and evidence of intracranial abnormalities on fetal ultrasound

- The rationale for this approach is that most infected infants have a good prognosis and, on average, do not differ in their development at three to four years from uninfected children

Diagnostic testing (PCR)

- Amniocentesis to obtain polymerase chain reaction (PCR) for *T. gondii* DNA in amniotic fluid is offered to women at ≥18 weeks with confirmed or strongly suspected recent infection for diagnosis of fetal infection.
- PCR is the best method for prenatal diagnosis of fetal infection .
- If PCR is positive, the treatment regimen is recomended .
- If PCR is negative, some clinicians recommend serial fetal ultrasound examinations to detect fetal abnormalities suggestive of infection in case of a false-negative PCR result

Ultrasound follow-up

- After fetal infection has been confirmed or excluded by PCR, serial fetal ultrasound are not warranted, as findings would not impact the treatment plan .
- An exception would be if development of or worsening fetal sonographic abnormalities would prompt the patient to consider termination of pregnancy.

EFFECT OF PRENATAL TREATMENT —

- Reduction of mother-to-child transmission of infection soon after seroconversion.
- If transmission occurs treatment reduces the risk of serious neurological sequelae but may not prevent mild sequelae.

Drug regimen

- The drug regimen is based on gestational age at diagnosis and whether fetal infection has been documented.
- Women <18 weeks of gestation at diagnosis – Spiramycin 1 gr Tid is begun and continued until results are available from PCR of amniotic fluid after 18 weeks .
- If PCR is positive or fetal ultrasound , spiramycin is discontinued, and pyrimethamine-sulfadiazine plus folinic acid is begun and continued until delivery.
- If PCR is negative and fetal ultrasound examination is not suggestive of congenital toxoplasmosis, spiramycin is continued until delivery.

Women ≥18 weeks of gestation at diagnosis

- Pyrimethamine-sulfadiazine plus folinic acid is begun, and PCR of amniotic fluid obtained .
- If PCR is positive, treatment is continued until delivery.
- If PCR is negative, pyrimethamine-sulfadiazine plus folinic acid can be continued or switched to spiramycin alone.

Timing pregnancy after maternal infection

- Immunocompetent women infected prior to conception virtually never transmit toxoplasmosis to the fetus
- although rare exceptions have been reported when infection occurred within one or two months before conception
- a delay of six months has been suggested

- immunocompetent women who become pregnant at least three months after an acute infection are unlikely to transmit the infection to the fetus.

Thanks for your attention