

The Pelvic X-Ray in Obstetrics

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The pelvic X-ray may be used in the following situations as a diagnostic aid:

(a) Routine inlet, lateral and flat plates in all ward clinic primipara, and in all private patients at the discretion of the clinician. Some additional things which might require use of the X-ray are:

(b) Bleeding in the last trimester of pregnancy;

(c) In the diagnosis of difficult cases to determine the presentation and position of the fetus.

Examples are twins with hydramnios, or in patients with a bulky fat abdomen.

(d) To confirm the diagnosis of fetal death.

The methods used vary tremendously in complexity, but the one with which I am familiar is Thom's method, which recommends itself through its simplicity. In the first instance mentioned, in which routine films are taken, the patient is postured on the X-ray table with her pelvis tilted so that the plane of the inlet is parallel to the X-ray plate; then she stands up, and has a lateral and flat plate of the abdomen taken. Lead grids are placed on the exposed plates and these plates are again exposed to give a method of calibration for the various measurements.

Now how much information may be obtained from these films? First

of all, by measuring the inlet films with calipers directly the antero-posterior, transverse, and combined index of the pelvic inlet can be determined and thus a good idea of the type of labor obtained as far as cephalo-pelvic disproportion is concerned, as most difficulties arise at the pelvic inlet. In addition, the prominence of the ischial spines may be noted giving a clue as to the adequacy of the mid-pelvic plane. Also, any bony abnormality of the pelvic inlet such as tumor, fracture, etc., may be seen, most tumors being situated at the inlet of the pelvis.

The type of pelvis can be determined with regard to the shape of the pelvic inlet. There are numerous classifications of the pelvis the simplest being that based on a description of the pelvic inlet. Those pelvises with a transverse diameter equal to or up to one centimeter greater than the antero-posterior are called circular pelvises; pelvises with a transverse diameter between one to three centimeters greater than the antero-posterior are considered as gynecoid types; and those with a transverse diameter greater than three centimeters compared to the antero-posterior are considered as flat pelvises. One other type of pelvis is the anthropoid, in which the antero-posterior diameter is greater than the transverse. Circular pelvises and anthropoid types generally give the best prognosis for labor due to their favorable inlet diameters.

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The lateral film tells the physician,

1. the degree of engagement of the presenting part which has taken place, if any.
 2. the adequacy of the pelvic mid-plane, antero-posterior diameter.
 3. the size of the promontory of the sacrum, as well as its type, whether curved or straight, short or long. The long curved sacrum seems to be better suited for internal rotation of the presenting part than do the straight and/or short types of sacrum.
 4. the anterior sagittal and posterior diameters of the pelvic outlet, the anterior sagittal diameter being the distance from the lower edge of the symphysis pubis to the bi-tuberous point, and the posterior sagittal diameter, the distance from the bi-tuberous point to the tip of the sacrum.
 5. the tilt of the pelvis or relation of the pelvic inlet plane to the horizontal plane can be measured, although the shape of the symphysis may cause some variation here.
- From the flat plate of the abdomen, one may note:

1. the position and presentation of the fetus or fetuses.
2. any abnormalities such as dead fetus, opaque kidney stone, an increased amount of amniotic fluid.
3. a rough idea of the size of the baby.

Thus a considerable amount of information may be added to the physician's clinical impression to give a

clearer and sometimes more accurate picture of the pregnancy and consequently a more intelligent management of labor. In cases where there is any disparity between the clinical and radiological findings, one would be inclined to favor the clinical impression in the great majority of cases. In addition to the above mentioned information available, a second advantage to routine x-ray is that a lasting record of the woman's pelvis is available which may be of value in future pregnancies.

Against the routine x-ray of primipara is the cost of the films, the fact that the majority of deliveries are uncomplicated and in most cases the clinical findings are sufficiently accurate and finally, the necessity for an x-ray unit and a technician trained in x-ray pelvimetry.

Many patients unfortunately begin to bleed slightly during the last trimester of pregnancy. A placenta-gram taken from seven months on to term can often confirm or rule out the diagnosis of placenta previa in such patients. While the diagnosis can be made clinically, it is much safer to x-ray the pelvis than to do a vaginal examination which may precipitate brisk hemorrhage and result in the death of both mother and baby if proper precautions are not taken before the examination. Actually, a placenta-gram is only two lateral films of the soft parts of the abdomen and one flat plate of the abdomen showing the pelvic inlet in addition. The placenta is seen as a thickening on the uterine wall. A placenta seen high on the posterior or anterior wall rules out the diagnosis of placenta previa

as does a head well centered in the pelvic inlet.

A further aid in diagnosis occurs in those cases where a patient is very obese, and the fetal parts are difficult to feel, and also in cases of multiple pregnancy associated with slight hydramnios. It is nicer in such cases to be able to tell the patient with confidence that she has two babies in her uterus than to present her with two babies in the case room, in which case she wants to know "where you got the other one".

Occasionally, on routine x-ray one may see an anencephalic monster or some other abnormality of the fetus which has been unsuspected up until this time, but usually, there is some clinical evidence such as, the presence of excessive fluid in the abdomen, or the feeling of the patient that she is no longer pregnant, in which case x-ray confirms the diagnosis.

Once in a while, you may want to confirm fetal death by means of the x-ray. If you have a flat plate done of the abdomen and see:

1. marked overriding of the bones of the vault of the skull,
2. marked angulation of the vertebral column,
3. the baby's skeleton seems to be crowded together too closely; these findings together with a patient who no longer feels pregnant and gives other clinical signs of fetal death, you can be almost positive of the diagnosis.

Summary:

1. The use of the x-ray in obstetrics is of limited, but nevertheless valuable assistance as an aid to diagnosis; in certain cases as outlined above, these include,

- (a) bleeding in late pregnancy
- (b) to confirm fetal death and other abnormalities
- (c) to obtain additional information where abdominal palpation is indefinite
- (d) routinely, as a screening procedure in the obstetrical outpatient clinic particularly for primipara.

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