Table 1.—Amniotic-Fluid Analysis

INDICATION	FETAL OR MATERNAL CONDITION
Antenatal diagnosis of congenital abnormalities (in general)	Chromosomal aberrations Inborn errors of metabolism Sex-linked hereditary disease Congenital adrenal hyperplasia
Diagnosis of fetal malformations	Congenital malformations Hydroamnios Pregnancy with diabetes
Assessment of fetal maturity	Rh incompatibility Pregnancy with diabetes Pregnancy with uncertain dates Severe toxemia
Amniotic water volume	Hydramnios
Fetoplacental function	Placental dysfunction

Consequently, this approach could present a serious medicolegal problem — at least in some countries.

Congenital adrenal hyperplasia. Jeffcoate et al,[9] in 1968, successfully predicted the diagnosis of congenital adrenal hyperplasia from levels of 17-ketosterones and pregnanediol estimated in amniotic fluid; levels were markedly elevated as compared to those of four normal pregnancies. However, Fuchs and Cederqvist[10] do not believe that one can predict congenital adrenal hyperplasia solely on the basis of hormonal levels in amniotic fluid.

Amniography and fetography. The ability to detect either hereditary or nonhereditary fetal malformations would be extremely useful. Techniques directed toward this goal essentially rely upon visualization of the fetus. Four diagnostic approaches have been taken: roentgenography, amniography or fetography, ultrasonic scanning, and direct visualization. Amniography or fetography are modifications of the classic x-ray technique of visualizing the intrauterine fetus. Contrast medium is injected after amniocentesis is carried out. Soft-tissue abnormalities in the fetus, such as meningocele, displace the opacified amniotic fluid, permitting the intrauterine detection of abnormalities. Some results of fetography performed in our department are illustrated in Figures 1 and 2. The first shows a normal fetus; the second, anencephalus.

Assessing fetal maturity. There are instances in which pregnancy must be terminated prematurely in order to save the infant's life. This may occur, for example, in some instances of severe toxemia, prolonged pregnancy, Rh incompatibility, or diabetic pregnancy. In these and certain other conditions, it would be enormously helpful to confirm gestational maturity when any doubt exists and, also, to detect early signs of any fetoplacental dysfunction. Presently available diagnostic methods include: fetal heart rate and electrocardiogram; fetal electroencephalogram; sonography; amniography; and urinary estrogen value. However, these tests do not always provide the information desired. With increasing confidence being placed upon amniocentesis, new test methods are now appearing in the literature. It seems reasonable to suggest that the evaluation of amniotic fluid—the fetal environment—will one day provide maximal information regarding various fetal conditions.

Amniotic-fluid volume determinations. Several methods now available for determining the amniotic-fluid volume by amniocentesis are clinically important in diagnosing hydramnios and oligohydramnios.

Clinical Experience with Amniocentesis in 91 Women

Between July 1966 and May 1973, 141 amniocenteses were performed in 91 women at the Department of Obstetrics and Gynecology of the University of Tokyo. Indications for the procedure are listed in Table 2. Among these are genetic counseling, diagnosis of fetal anomalies, Rh incompatibility, and assessment of fetal maturity, which