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Mid-trimester abortion using extraovular normal saline

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The evacuation of a large uterus is a dangerous procedure with complication rates three to four times higher than uterine evacuation in the first trimester (Danforth, 1982). Fifteen percent of abortions performed in the USA between 1972 and 1975 were mid-trimester abortions, which accounted for almost 60% of abortion-related maternal death (Cates et al., 1977).

In an effort to lower the complication rates, many methods have been tried, differing according to the success rates but having in common a high rate of incidents, accidents and complications. The methods available to terminate a mid-trimester pregnancy or a mid-trimester missed abortion utilize various approaches, as shown below.

The vaginal route

Intravaginal administration of prostaglandins PGE$_2$ or PG$_{2a}$ suppositories can induce evacuation of a large uterus with a large degree of success. The method is simple, relatively safe but the drug-related side effects of prostaglandins (nausea, vomiting, diarrhea, bronchospasm, etc.) are not infrequent (Schulman et al., 1974; Lauersen et al., 1975).

Dilatation and curettage or vacuum aspiration may be the solution to the problem of a large uterus between 12 and 15 weeks only. However, this procedure has an increased risk of uterine perforation, incomplete evacuation, infections, cervical damage, etc. (Lauersen, 1981; Cates et al., 1979).

The extraovular route for administration of rivanol, hypertonic saline, prostaglandins or other drugs was described by Scandinavian and Japanese gynecologists. This route is quite simple and safe, but side effects related to the various drugs used for frequently encountered (Gustavii, 1974; Halbrecht and Blum, 1974; Wiqvist et al., 1974; Shapiro, 1975).

The intra-amniotic route

This is the most widely used approach. It consists of amniocentesis and intra-amniotic instillation of pharmacological agents such as hypertonic glucose,
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urea, hypertonic saline, prostaglandins, etc. All these drugs injected into the amniotic sac are effective in producing abortion by different mechanisms. However, they tend to induce drug-related side effects which are characteristic according to the drug used: hypernatremia and consumption coagulopathy where hypertonic saline is used, gastrointestinal symptoms, uterine hypertonicity, bronchospasm where prostaglandins are administered, severe infection where hypertonic glucose is used, etc. (McDonald and Aaro, 1975; Berger et al., 1975). In addition to these drug-related complications, there are difficulties related to the amniocentesis itself, especially in cases of obese women, anterior location of placenta or in mid-trimester missed abortion cases, where there is little or no fluid left in the amniotic cavity.

The parenteral route

Oral, intravenous or intramuscular prostaglandins or intravenous oxytocin are used to induce mid-trimester abortions as primary methods but are more frequently used in order to shorten the instillation-abortion time when other methods are used. The drug-related side effects are not infrequent.

The abdominal operative route

Hysterotomy or hysterectomy are rarely performed these days in order to evacuate a large uterus. These are surgical procedures associated with the relevant operative morbidity and mortality rates (Lauersen, 1981). They are recommended today only in cases where other methods have failed, when the woman wants to combine abortion with sterilization or when there is associated uterine or ovarian pathology — e.g. uterine fibroids, ovarian cysts or tumors.

Most of the complications in mid-trimester abortions have two main features:

1. the drug-related side effects and complications;
2. the difficulties and complications related to the needle penetration into the amniotic sac when the intra-amniotic route is used.

To avoid these two main sources of complications, we use normal saline (having no side effects), which is instilled, not intra-amniotically, but through the normal physiologic opening of the cervix into the extraovular space. This is done by using a specially designed double balloon catheter (Atad’s Catheter, manufactured by Porges, France), which is introduced through the cervix to a depth of 10 cm into the extraovular space without rupturing the membranes (Fig. 3.1). The catheter is guided to the opposite side of the placental insertion. When the catheter is positioned and the two balloons are inflated (30 cm³ normal saline), one balloon occludes the external os and the other the internal os of the cervix, thus preventing leakage of the saline solution from the extraovular space through the cervix into the vagina (Rofe et al., 1980; Abramovici et al., 1981).