A PRELIMINARY EXPERIENCE WITH FETOSCOPY

By

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SUMMARY

Fifty one patients were subjected to Fetoscopy over a period 6 months in the year 1985. All these patients wanted a second trimester termination of pregnancy. This was a pilot study performed to evaluate feasibility regarding usage of this procedure on wider scale as we were interested to promote Fetoscopy. Its merits and demerits were assessed and analysed.

Introduction

Fetoscopy is a procedure of introducing narrow diameter endoscope inside the pregnant uterus for the purpose of visualising the fetus and obtaining fetal blood and skin biopsies. With the advent of narrow diameter endoscopes, modern antibiotics and tocolytic agents this dream of visualising the fetus in utero has become a reality.

As the procedure has its own inherent risks like introducing infection, initiating the process of labour, traumatising the placenta and fetus in utero, thus with the advent of modern ultrasound, chorionic villous sampling, and other investigatory facilities, the fetoscopy has lost its popularity and need. However, in best of hands it is still an excellent tool for analysis of the fetal genetic and other haematologic anomalies in utero and should be thus utilised with success when the need arises.

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Material and Methods

Fifty one patients between the age group of 17 to 36 years who were to undergo second trimester termination of pregnancy were chosen for this study Gestational age of the patients was ranging from 14 weeks to 20 weeks of amenorrhoea. The procedure of fetoscopy was carried out in obstetric operation theatre under general or local anaesthesia. To select the optimal insertion site for fetoscopy prior to fetoscopic examination, an ultrasonic visualisation was done in 82.35% cases using a linear array real time scanner.

Fetoscopy was carried out, transabdominally, using a rigid 2.2 mm diameter endoscope (Dyonics) as detailed below:

— The patient after voiding was placed in a supine position and the abdomen prepared and sterile drapes placed under anaesthesia.

— The entry site chosen on the basis of sonography was infiltrated with 1% Xylocaine; premedication with i.v. pethidine 50 to 100 mg, phenargan 25 mg was used and

a 3 to 4 mm skin incision made. The trocar cannula was inserted with a sharp and controlled thrust into the amniotic cavity.

— The return of amniotic fluid on removing trocar confirmed the correct placement. After the returning amniotic fluid was found to be clear, the endoscope was inserted and the fetus was visualised.

Difficulties that came whilst performing the procedure were—A bloody tap of amniotic fluid which needed abandoning the procedure in 2 out of 51 cases; floating of amnion across the endoscope acting as a veil obscuring the view. This veil could however be dislodged with gentle manipulation.

Once the fetal horizon was identified, the horizon was followed until a recognisable fetal part was found. Specific parts of the fetus could be readily identified in 41 cases but a total examination of surface anatomy was possible in only 24 cases. The limbs and digits were seen in all 41 cases. Details of skin surface including dermal ridges, hair follicles and sweat pores could be well appreciated. External genitalia were seen in 78% of cases. The sex was determined at the same time but was never discussed with relatives or recorded.

The head including mouth, nose, ears, closed eyes were seen in 90.24% cases. Certain fetal behaviours were witnessed through the fetoscope and this included thumb sucking and opening and closing of the mouth. The placenta was seen in all the cases along with the cord. We attempted fetal blood sampling using a sterile 23 gauge needle in 6 cases. It proved successful in 3 cases. Attempted skin biopsy in 2 cases using a small biopsy punch process inserted through a second puncture cannula was unrewarding.

The average viewing time was approx 20 minutes. After fetal visualisation was complete, the scope was withdrawn and abortion was induced.

Results

41.2% of the patients were between the age of 17 to 19 years. An ultrasonic visualisation was done in 42 cases, of which only 3 cases had a bloody/blood stained tap. In two cases Fetoscopy was abandoned due to increased turbidity of amniotic fluid in one and traumatising the placenta which hampered the vision in the second.

Table V shows the number of attempts of Fetoscopy. In 82.35% Trocar was inserted successfully at the first attempt. The first attempted insertion of the trocar is the best and should be sharp and controlled.

TABLE V

No. of Attempts at Trocar Insertion

No. of Attempts	Total No. of cases	No. of cases yielding Bloody/ Blood Stained AF
1	42 (82.35%)	3 (7.14%)
2	7 (13.73%)	3 (42.86%)
3	2 (3.92%)	2 (100%)

Abortion was induced after completing the procedure using either hypertonic saline solution (20%) or extra-ovular ethacrydine lactate depending upon (1) Duration of gestation and (2) Colour of amniotic fluid at the end of fetoscopy. The induction abortion interval was shorter than the average.

Discussion

Visualising the fetus has been attempted over quite a few years in the past. Westin (1954-57) passed a 10 mm diam. hysteroscope through the cervix rupturing membranes to obtain a view of the fetus. In 1973 Valenti (1973) used a 6 mm paediatric cystoscope and was the first to obtain fetal blood and skin biopsies prior to termination of pregnancy. Sorimgrour (1973) too used a similar technique and a 2.2 mm endoscope for diagnosis of neural tube defects. Success rate then was only 50%. Kan *et al* in 1972 studied and thought of the possibility of prenatal diagnosis of haemoglobinopathies. Rodeck and Cambell (1978-79) simplified the analysis of fetal blood by umbilical cord insertion for various parameters.

The advantages for cord blood sampling are tremendous (Rodeck, 1980) has shown a 95% success rate for aspiration of pure fetal blood from within the vessel lumen. Today fetal therapy by intravascular injection/transfusion is possible. Fetal blood loss due to cord blood sampling is less since haemostasis in the cord is possible. Also an anterior placental cord insertion can be easily sampled.

Cord blood can be used for diagnosis of haemoglobinopathies, prenatal diagnosis of Haemophillia A & B. Chromosomal abnormalities and certain aspects of fetal physiology can also be studied by cord blood sampling. Fetal karyotype can be made available from fetal lymphocytes within three days after sampling. Igm antibodies can be analysed and a diagnosis of in utero fetal infection can be made around 18-20 weeks by cord blood sampling. Further certain rarer conditions like chorionic granulomatous disease, X linked defect of polymorphs, red cell enzyme defects, alpha 1 antitrypsin deficiency, immuno deficiency syndromes and metabolic disorders can be diagnosed.

1 mm by 1.5 mm skin biopsy six is sufficient to make accurate diagnosis of conditions like Epidermocytic hyperkeratosis, congenital icthyosis etc. Complete fetal examination is possible especially of face, oral cavity, limbs, chest, abdomen and defects can be easily established.

Our experience showed a shortened induction abortion interval probably due to the increase in prostaglandines F_2 alpha and therefore following this procedure antibiotics and beta mimetic drugs should be very essential, atleast for 1 week. RH anti-D globulins should also be given to Rh negative patients as a prophylactic measure.

Fetoscopy today has gone in the background because of more sophisticated investigatory procedures like Ultrasonography, amniocentesis, chorion villous biopsy and recombinent DNA techniques, which permits DNA analysis.

Though in certain specialised centres fetoscopy is being performed with considerable skill and dextrity, the risks of the procedure are negligible (less than 5% risk of spontenous abortion) yet, we have to prove its usefulness to its disadvantages like infection and risks of preterm labour in our set up. The procedure therefore should be carried out only in adequately equipped centres and by experienced persons and a lot of further analysis of the same is highly essential.

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