

## ROLE OF FETOSCOPY IN PRENATAL DIAGNOSIS

SUNEETA MITTAL • KAMAL BUCKSHIEE • NEERA AGARWAL

### SUMMARY

The technique of fetoscopy has been evaluated in 20 patients undergoing Medical Termination of Pregnancy. The procedure could be successfully established. Method has been described in detail and role of fetoscopy for prenatal diagnosis in the present context has been discussed.

### INTRODUCTION

Fetoscopy is a technique whereby the second trimester fetus can be visualized directly utilizing a specially designed fiber optic endoscope (Fetoscope). This technique has been utilized for the diagnosis of gross fetal malformations and external structural defects in the fetus. Fetal blood sampling, liver biopsy and fetal skin biopsy obtained through fetoscope can be used for prenatal diagnosis of haemoglobinopathies, fetal coagulation, metabolic and cytogenetic disorders, immune deficiencies and fetal infections. This highly specialised technique has been established in a few countries only. In the present work, fetoscopy as a diagnostic procedure has been evaluated in the Indian perspective.

### MATERIALS AND METHOD

Twenty patients undergoing midtrimester abortion for Medical Termination of pregnancy were included. An informed consent was obtained before the procedure. All patients had a detailed ultrasonographic evaluation prior to fetoscopy for diagnosis of fetal viability, gestational age, detection of congenital anomalies, placental localization and to mark the optimal site of entry into the abdomen. All procedures were done under anesthesia. After stabilizing the uterus the fetoscope trocar and cannula were introduced into the amniotic cavity at the optimal site previously selected. Instrument used was Richard Wulf Fetoscope. After removing the trocar, the fetoscope (86724.31 with 5° angle) was introduced. Systematic visualization of all fetal parts, placenta and chorionic plate was undertaken.

Dept. of Obst. & Gyn., All India Institute of Medical Sciences, New Delhi.

Accepted for Publication on 20.10.1993

For obtaining fetal blood samples a fetoscope (4977.32 with 10° angle) with a side channel replaced the former instrument. Fetal blood samples were obtained after localizing the umbilical cord near its entry into the placenta. After completion of the procedure, pregnancy was terminated by hysterotomy.

The removed fetus was examined in details to substantiate the results of fetoscopic inspection.

#### OBSERVATIONS AND RESULTS

The procedure was carried out successfully in 18 cases. Their pregnancies ranged from 16-19 weeks. All of them were multigravidae desiring termination of pregnancy along with tubal ligation. Direct fetal visualization of all anatomical details was possible in 16 cases only. In one case the fetus could not be visualized, as the liquor was blood stained in case another because of technical problems. Fetal blood sampling was tried in 8 cases. The sample could be obtained in 3 cases only. No fetal biopsies were tried out due to non-availability of instruments. In all cases where fetal and placental visualization was successful, location of placenta and fetal position as identified on fetoscopy were confirmed on hysterotomy, as also corroborate fetal details on gross inspection of the removed fetus. Location of placenta, position of fetus and fetal sex was identified correctly in all the cases. None of the fetuses examined had any structural defect identified either on fetoscopy or on gross inspection of the fetus. No complications occurred either during the procedure or subsequently.

The following observations were made for successful establishment of procedure :

- a. Ultrasound visualization to identify a good liquor pocket for placement of

fetoscope is a must.

- b. Anterior placenta did not interfere with the procedure, uterine entry was possible from one side.
- c. It was essential to fix the uterus before puncture.
- d. Entry with single thrust of trocar resulted in minimum trauma. In the patient with blood stained liquor uterine entry was possible after three insertions and this subsequently resulted in failure of visualization.
- e. Systematic inspection of the fetus took approximately 20 minutes after adequate experience was gained.
- f. Only a 26g needle could be passed through the fetoscope which would get blocked easily, this resulted in failure to obtain blood samples in some of the cases.
- g. For blood sampling the ideal site was near the placental entry of the umbilical cord. An attempt to puncture the free cord in liquor resulted in failure. Two chorionic plate puncture yielded maternal blood.
- h. Visualization was better below 18 weeks, liquor was hazy in cases with gestation exceeding 18 weeks.

#### DISCUSSION

Though fetal visualization was done earlier through the cervix, Valenti (1972) was the first to carry out transabdominal fetal inspection by using a cystoscope at laparotomy. Valenti (1972) also utilized the technique to diagnose fetal haemoglobinopathies (1973). Hobbins and Mahoney (1977) carried out fetoscopy successfully in patients continuing pregnancy. Rodeck and Campbell (1978) are credited for extending the use of fetoscope for obtaining fetal blood sample and diagnosing fetal disorders prenatally. Rodeck et al (1981) also carried out fetal skin biopsy and intravascular

intrauterine fetal transfusion (1981) successfully through a fetoscope. Eady et al (1984) described ultrasonographically guided fetoscopic skin biopsy, subsequently the same has been done by percutaneous ultrasound guidance without using a fetoscope (Buckshee et al, 1991).

Over the last decade over 5000 diagnostic fetoscopic procedures have been performed in the world over, including detection of over 70 gross congenital abnormalities. Fetoscope has also been used therapeutically for intrauterine transfusion, albumin infusion and selective fetocide. In literature optimal time reported for fetal visualization is between 18-20 wks. Obtaining a fetal blood sample before 18 weeks is associated with risk of fetal haemorrhage while after 20 weeks amniotic fluid gets cloudy. A limited panorama of fetal anatomy is offered, visualization of a particular organ may or may not be possible.

Maternal safety of fetoscopy is well established. Several complication described in literature include rupture of membranes, amnionitis, abruptio placenta, abortion, fetal injury or demise and maternal or intra-amniotic haemorrhage. A fetal mortality of 2-5% is reported.

#### CONCLUSION

Fetoscopy was established as a diagnostic procedure for fetal visualization. Number of limitation were identified. The procedure could be successfully carried out only within a limited period of pregnancy and was considered non repeatative.

It was felt that gross structural fetal defects can be readily identified using ultrasound, a relatively simpler and non-invasive procedure with no limitations of time and can be repeated as and when desired. Identification of small discrete malformations like polydactyly, syndactyly, cleft lip etc. which may be difficult to identify on ultrasound do not influence the subsequent management of pregnancy to a significant degree.

As the expertise in interventional ultrasonography will increase fetoscopy will have a limited role for fetal diagnosis. With ultrasound guided technique for fetal blood sampling and fetal skin biopsy being well developed in all Department, fetoscopy has become outdated in the present context. Results are being published to update other scientists desiring to evaluate the procedure.

#### ACKNOWLEDGEMENT

The authors wish to acknowledge the research grant received from the Institute Research Fund for carrying out this work.

#### REFERENCES

1. Buckshee K., Parveen S., Mittal S., Verma K. & Singh M. : *Int. J. Gynec. Obstet.* 34;267,1991.
2. Eady R. J. A. and Rodeck C. H. : *Prenatal Diagnosis*; Ed : Rodeck CH and Nicolaidis K. H. p 147, 1984.
3. Hobbins J. C. and Mahoney M. J. : *Am. J. Obstet. Gynec.* 129;440,1977.
4. Rodeck C. H. and Campbell G. : *Brit. Med. J.* 2;728,1978.
5. Rodeck C. H., Kemp J. R., Holman C. A., Whitmore D. N., Karnicki J., Austin M. A.; *Lancet* 1 : 625, 1981.
6. Valenti C. : *Am. J. Obstet. Gynec.* 114;561,1972.
7. Valenti C. : *Am. J. Obstet. Gynec.* 115;851,1973.