SONOGRAPHIC DETERMINATION OF FOETAL SEX

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In order to determine foetal sex antenatally, 300 patients were examined sonographically over a period of two years (June 1993 - May 1995) using a 3.5 MHz sector probe. Gestational age ranged between 26 - 30 weeks.

Foetal scrotum, penis and labia majora were identified to establish the foetal gender. Of 258 ladies who reported back after confinement, diagnosis was correct in 214 (82.9%). There were 111 (43%) males and 103 (40%) females.

In 44 (17%) of our cases sex could not be ascertained. Main factors contributing to unsuccessful outcome were breech presentation (38%), multiple gestation (23.8%), oligohydramnios (11.9%), and non-optimal foetal position (26.2%). There were only two false positive results. Foetal hydrocele was noticed in three cases.

INTRODUCTION

Besides other miracles, ultrasound has made it possible to determine the gender of an unborn foetus '. Although females are equally important in our social and cultural set up, males are preferred. Naturally every married couple desires a son, while a daughter is accepted as God's will. Antenatal sex detennination has genetic indications as well as X- linked recessive genetic disorders are carried by females while males are the sufferers [2].

A study to find the foetal sex by ultrasound was conducted between June 1993 and May 1995 at Women and Children Hospital, Abbottabad.

MATERIALS AND METHODS

During the period from June 1993 to May 1994. 150 volunteer pregnant ladies were examined while from June 194 to May 1995, 150 more ladies were included, in the study. Period of gestation of all the patients ranged between 26-30 weeks.

Equipment used was Sigma 1-Ac (France) fitted with 3.5 MHz real time sector probe. Transverse sections of the uterus were taken; oblique and longitudinal sections were taken at times; patient was tilted to one or the other side to have the optimum view.

Scrotum, penis (Fig 1) and labia majora (Fig 2) were identified to determine the foetal sex. In rare cases labia minora could also be seen.

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Fig 1: Scrotum and Penis of a male foetus arc shown

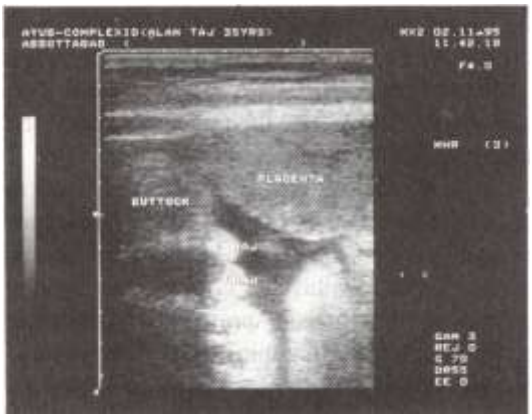

Fig 2: Labia majora indicating female sex are depicted

Filled urinary bladder of die foetus is very helpful ill localizing the external genitalia. The patients were followed up, or reported after delivery, and results were noted.

RESULTS

Out of 300 cases studied, 42 patients could not be contacted or did not report back. Of the remaining 258 cases, antenatally determined sex was later on proved true in 214 cases (82.9%).

Table-l shows the results of 1st year of study and Table-II that of 2nd year.

TABLE-1: 1ST YEAR STUDY, MAY 1993-JUNE 1994

Total Cases **Lost**	**150** **25 (16.7%)**
Remaining	**125 (83.3%)**
Male	**50 (40%)**
Females	**45 (36%)**
±	**30 (24%)**
Total	**125 (100%)**

TABLE-II: 2ND YEAR STUDY, MAY 1994-JUNE 1995

Total Cases	**150**
Lost	**17 (11.3%)**
Remaining	**133 (88.7%)**
Males	**61 (45.9%)**
Females	**58 (43.6%)**
±	**14 (10.5%)**
Total	**133 (100%)**

The accuracy rate during 1st year was 76% while in the 2nd year study accuracy rate rose to 89% indicating improvement in diagnosing both male and female foetuses. Similarly, rare of failure to determine sex dropped from 24% to 10.5%. This achievement is clearly the result of skill and experience gained in one year.

111 (43 %) patients carried male foetus while in 103 (40%) foetus was female. In 44 (17%) patients sex could not be determined. Main factors contributing to the inability to achieve the desired accuracy were: breech presentation, multiple gestations, oligohydramnios and non-optimal position of the foetus. This is shown in Table-111.

In two foetuses bilateral hydrocele (Fig 3) and in one unilateral hydrocele were noticed.

Only two false positive results were recorded.

One male labelled as female had bilateral undescended testes and another female foetus diagnosed as male had highly developed labia majora due to excessive hormonal stimulation.

Average examination time was 15 minutes. During 1st year of study it was 20 minutes while during the 2nd year it came down to 10 minutes.

TABLE-III: MAIN CAUSES OF FAILURE

Cause	Combined		1st Year		2nd Year	
	No	%	No	%	No	%
Breech	16	38.0	9	36.0	7	41.2
Twins	10	23.8	6	24.0	4	23.5
Oligohydramnios	5	11.9	3	12.0	2	11.8
Non- Optimal Position	11	26.2	7	28.0	4	23.5
Total	42	100	25	100	17	100

Figure 3. Male foetal genitalia with bilateral hydrocele are seen

Results at a glance are given in Table-IV.

TABLE-IV: SUMMARY OF STUDY

Total Cases **Lost**	**300** **42**
Remaining	**258**
Males	**111 (43%)**
Females	**103 (40%)**
±	**44 (17%)**
False Positive	**2**
Foetal Hydrocele	**3**

DISCUSSION

Visualization of scrotum, testes and penis are used to label the foetus as boy. Penis is earliest to appear (16 wks) but can be confused with a loop of cord. Urethra is sometimes seen especially

during micturition. Penile erection has been noted in some cases.

Scrotum and testes are seen as a freely hanging bags of low amplitude echoes which show movements when the overlying transducer is gently pressed and released.

The scrotum may not be visualized when:

a) It is placed between thighs and abdomen.
b) It is close to the placenta.
c) It is close to the uterine wall.
d) Feet are close to the rump.
e) Foetal spine is anterior and legs are on each side of the body [3].

In girl's rhomboid shape of the labia is characteristic. A more tangential section will show labia majora as well defined echogenic structures which do not show movements like scrotum. At section at right angle to this, "big and small bumps" of buttocks and labia majora are easily recognised. Occasionally labia minora can be observed as well [3].

Finding the gender of twins is probably more difficult and even more difficult is to attribute to each foetus its own sex [3]. hi 10 cases of present study this was the cause of failure.

As a general rule it has been difficult to see the foetal genitalia in breech presentations. In 16 cases we could not reach any conclusion due to this factor.

Sometimes foetal position poses a problem in recognizing the genitalia. This is especially so when foetal spine is anterior [4]. This was noted in 11 of our patient.

Oligohydramnios is a recognized cause of failure to establish foetal sex by ultrasound because it is almost impossible to distinguish various structures in a crowded environment. On the contrary it is easier to recognise genitalia in polyhydramnios [4].

Rarely, hypertrophied labia due to excessive harmonic action may mimic acrotum. Also scrotum without testes are echogenic and can be confused with labia majora [5].

In the present two years' study, accuracy rate in determining the foetal sex is 82.5% which is higher than quoted by other authors [2]. Also the accuracy rate of our first year study is 76% while that of 2nd year study is 89% which shows significant improvement.
Whether to disclose the foetal sex to the parents is an open question. Many colleagues think it unprofessional and unethical. They may be right keeping in view' the social and cultural background of our society.
Personally the author is of the opinion that:

1. Choice should be left to the parents even when the diagnosis is 100% correct.
2. Keep silent if the issue is clearly emotional e.g. 3rd or 4th girl.

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