

TESTICULAR DESCENT IN UTERO - A NEW PARAMETER OF FETAL MATURITY

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SUMMARY

Ultrasonographic assessment of fetal maturity is an important component of obstetric care. The present study was initiated with an aim to identify the timing of testicular descent in utero and to correlate this with fetal maturity. The descent was serially observed in 80 male fetuses from 30 weeks onwards. In 64 (80%) fetuses descent was noted to occur between 34-35 weeks and in 13 (16.85%) between 35-36 weeks. Statistical calculations revealed a sensitivity and specificity of 98.25% and a positive predictive value of 100%. Thus it was concluded that in utero testicular descent could form an additional parameter for assessing fetal maturity.

INTRODUCTION

Ultrasound has revolutionized the monitoring of development of the fetus in utero, however in utero descent of testis is perhaps the least studied subject. Majority of full term infants (97%) are born with the testes in the scrotal sac at birth, but the exact timing of the descent of testes has not been well documented.

Male genitalia can be identified on real time ultrasound examination as early as 15 weeks (Birnholtz, 1983). On

ultrasonography the testicles can be seen in the scrotal sac as oval echodense areas compared to relative echogenicity of the rest of the sac. The present study has been carried out to study the actual time when testicular descent occurs in utero and correlate this with fetal maturity.

MATERIAL & METHODS

This study includes pregnant women attending antenatal clinic of All India Institute of Medical Sciences. Patients in whom the fetus was identified as male using a real time linear ultrasound scanner (Aloka,

3.5 MHz) on routine scan during the second trimester were enrolled. Only patients with known menstrual dates were included and period of gestation was calculated in exact number of completed weeks. The accuracy of dates was confirmed by ultrasonographic measurement of fetal parameters on earlier first or midtrimester scan. Subsequently, to pinpoint the actual time of testicular descent in these fetuses ultrasound was repeated weekly from 30 weeks onwards, till intrascrotal identification of testes on both sides was made by clearly observing the oval echodense areas in the scrotal sac. Absence of echodense shadow or presence only on one side was taken as non-descent. Sensitivity and specificity of the different cut off points of gestational age were computed using standard statistical methods.

Fetuses identified as female on first scan were screened again after 6-8 weeks to ensure that no male fetus was missed.

RESULTS

A total of 187 patients were included in the study. In 96 cases the fetus was identified as female and the sex reconfirmed in 95 of these cases. All these were born as female infants. One case looked suspicious on rescan at 28 weeks and despite rescanning again at 30 and 32 weeks no definite sex could be assigned to this fetus. The infant was born with ambiguous genitalia.

In 91 cases the fetus was identified as male. After excluding cases with discrepancy between menstrual and ultrasound dates or those delivering before 37 weeks, a total of 80 patients were included in the study. Out of 80, 56 patients were nulliparous and the rest multiparous. Screening for testicular descent commenced at 30 weeks and a single patient had 7-11 scans at weekly interval. All observations were grouped at one week interval. Earliest descent was noted at 33 weeks and 3 days in 1 (1.25%) of 80 fetuses (Table-I). In 64 (80%) the

Table I

Period of gestation and in utero testicular descent

Weeks of Gestation		Descent present	
		No.	%
	<33	Nil	-
33	- <34	1	1.25%
34	- <35	64	80%
35	- <36	13	16.25%
>36	<37	1	1.25%
		79	98.75%

Table II

Sensitivity, Specificity and Predictive Values for in Utero Testicular Descent at Different Gestational Ages.

Gestational age	Sensitivity (%)	Specificity (%)	Predictive -ve decent Immaturity (%)	Values + ve decent Maturity (%)
<33 wks.	100.00%	98.75%	100.00%	00.00%
<34 wks.	98.75%	98.75%	98.75%	1.25%
<35 wks.	98.75%	20.00%	20.00%	80.00%
<36 wks.	98.75%	2.50%	2.50%	97.05%
<37 wks.	98.75%	1.25%	1.25%	98.75%

descent occurred between 34-35 weeks. Another 13 (16.85%) fetuses had bilateral intrascrotal testes between 35-36 weeks of menstrual age. In one of the remaining two fetuses the descent was seen on repeat scan at 36 weeks and 3 days and no descent was observed in another. This infant was born at term with undescended testes. In one case having descent at 34 weeks and 3 days bilateral hydrocele was detected as echofree space surrounding the testicular density. Hydrocele increased only marginally on subsequent scans and the neonate delivered at term with bilateral hydrocele

All 80 infants were male at birth and assessment of their maturity was correlated with gestational age.

No fetus had testicular descent before 33 weeks and all but 2 had descent by

36 weeks. Sensitivity and specificity of testicular descent to predict fetal maturity was statistically calculated at each period of gestation. Sensitivity of absent testicular descent below 33 weeks was 100%. At 34 weeks both sensitivity and specificity were 98.75%. Accuracy for prediction of fetal immaturity with absent testicular descent was 100% below 33 weeks, 98.75% below 34 weeks, 20% below 35 weeks, 2.5% below 36 weeks and 1.25% below 37 weeks. Positive predictive value of present testicular descent to predict fetal maturity was 98.75% at 37 weeks, 97.5% at 36 weeks, 80% at 35 weeks & 1.25% at 34 weeks. Taking 35 weeks gestation age as a reasonable indicator of fetal maturity, testicular descent was absent in 20% fetuses at 35 weeks and present in 80% while absent in 98.75% below 34 weeks and present in 97.5% above

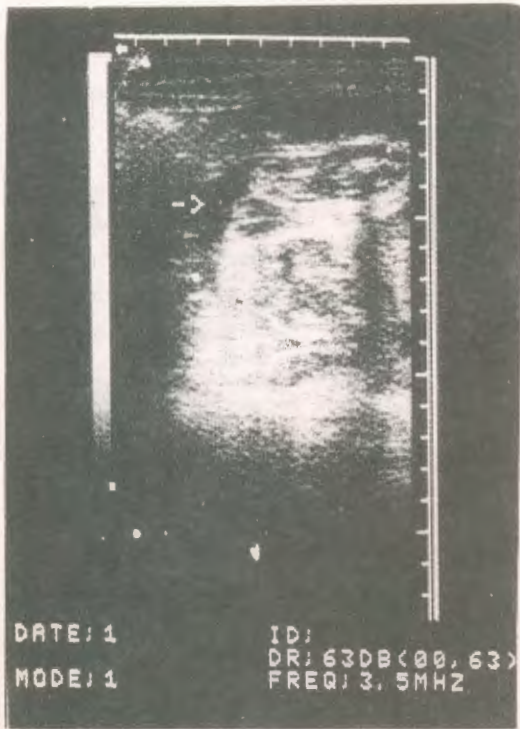


Fig. 1 - Normal Female Genitalia

36 weeks gestational age. Thus one could reasonably conclude that absence indicated a maturity of <34 weeks and presence a fetal maturity between 35-36 weeks.

DISCUSSION

Cryptorchidism is seen in 2.7-6% of babies born at term (Tripathi et al, 1992). In utero testicular descent is still a relatively less studied subject.

Fetal sex can be determined ultrasonographically by observation of external genitalia (Shalev et al, 1981). With technical advances as well as increasing operator experience it is possible to do so with greater accuracy and at earlier gestational age (Plattner et al, 1983).

Elejalde (1985) commented that visu-

alization of fetal genitalia may be difficult in 30% cases, because of unfavourable fetal positioning at the time of scan. A review of literature by the authors revealed inaccurate diagnosis in 3% of cases.

Besides identifying sex, some of fetal genital problems may also be detected in utero. Currently there are isolated case reports of prenatal ultrasonographic diagnosis of fetal scrotal inguinal hernia (Meizner et al, 1992) and fetal abdominoscrotal hydrocele (Sasidharan et al, 1991).

Testicular descent is used as a determinant of gestational age in the newborn (Dubowitz et al, 1970). Kempe et al (1974) described examination of external genitalia as a criteria for clinical estimation of gestational age of neonate. According to



Fig. 2 - Normal Male Genitalia - Testicles undescended

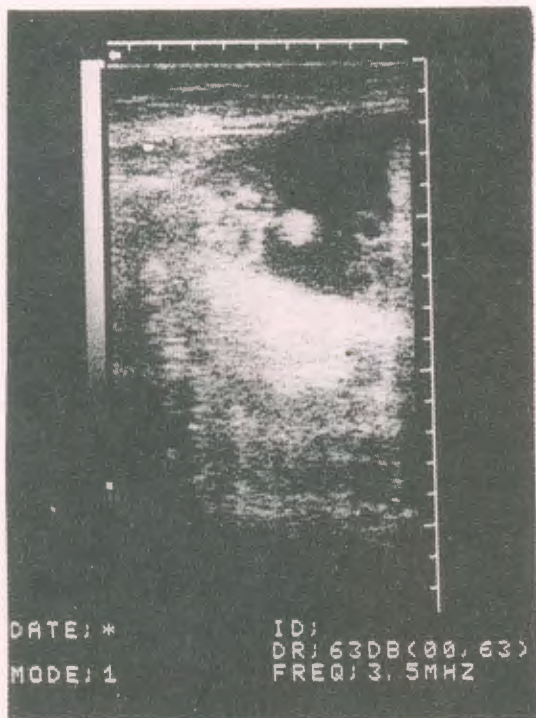


Fig. 3 - Normal Male Genitalia - Testicle descended

them testes is palpable in inguinal canal between 28-36 weeks gestational age infant, in the upper scrotum between 36-40 weeks and in lower scrotum after 40 weeks. Earliest palpation at external inguinal ring is described at 30 weeks. Scorer (1956) while studying neonates born at different gestational ages observed no descent of testes in fetuses with birth weight less than 800 gm, in 40% fetuses weighing between 900-1000 gm. and in 80% fetuses weighing over 2000g.

Testicular descent in utero has not been correlated with fetal maturity. Birnholz

(1983), while trying to determine fetal sex ultrasonographically also looked at testes in the scrotal sac. In no instance he observed testicular descent before 26 weeks, but found descent in 93% fetuses after 32 weeks. He did not screen patients serially and did not consider this feature as an indicator of fetal maturity, but observed that determination of male sex was possible by identifying testicles in the scrotal sac between 25-34 weeks.

In our series, serial observations revealed earliest descent only after 33 weeks and in majority (96.25) testicular descent was seen to occur between 34-36 weeks of gestation. Thus we conclude that presence of testes in the fetal scrotal sac on ultrasound may be considered a useful parameter of fetal maturity beyond 34 weeks.

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