UTERINE INVOLUTION

Following Normal Labour, Abnormal Labour and Puerperal Sterilization (812 Cases)

by

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The problem of uterine involution is rightly considered as Cinderella of the obstetric world. Very few studies have been made of uterine involution under different conditions. A study of the textbooks of obstetrics reveals that different views are expressed by the authors. To quote a few references, it is mentioned in British Obstetric Practice, "After labour the uterine fundus is 6 inches (15 cms) above the symphysis pubis. It sinks at the rate of ½ inch every day and disappears in about 12 days." Eastman and Hellman write in William's text-book, "Soon after labour the fundus of the uterus is midway between symphysis pubis and umbilicus, about 12 cms (4¾ inch) above symphysis pubis and sinks on the 10th day." Holland and Brews Obstetric Manual states, "The uterus is halfway between symphysis pubis and umbilicus at the end of one week and at the end of the second week just palpable above symphysis pubis". Menon writes in Mudaliar's Clinical Obstetrics, "Immediately after labour, the fundus is at the level of the umbilicus or one or two fingers below and by the 10th or 12th day it should be a pelvic organ". Masani mentions in his text-book, "Immediately after delivery the height of the uterus is just upto or below the umbilicus and by 12 to 14 days it sinks below the pelvic brim". It is clear from the above quotations that the British and the Indian teaching is that the uterus is upto or just below the umbilicus soon after labour; whereas American teaching is that the fundus is already midway between the symphysis pubis and umbilicus soon

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after labour. Moreover, the factors controlling uterine involution are not well studied.

The present study was undertaken to define norms for uterine involution in our part of the country. It was also our endeavour to study the factors which favour or retard the involution. As we continued our study, it became clear to us why the subject was not studied by others. We realised that unless we reduced the margin of error while measuring fundal height, the study would not be very useful. The position of the umbilicus in relation to symphysis pubis is variable. We found it varies with the height of the individual. So we felt that the umbilicus cannot be taken as a fixed landmark. To our chagrin we found that the measurements in the same patient by different doctors taken at the same time varied from ½ to 1½ cms. Not only this but the measurement on the same patient by the same doctor when taken at an interval of ½-1 hour also showed a difference upto 1 centimetre. In view of this difficulty, it was decided that records of fundal height in terms of actual measurements above the symphysis pubis would not serve a useful purpose if the error in measurement could be as much as ½ to 1½ cms. We selected the following landmarks to study the involution.

1. The number of days taken for the fundus to come midway between symphysis pubis and umbilicus.

2. The number of days the uterine fundus takes to become impalpable per abdomen.

3. The size of the uterus on vaginal examination after six weeks.

We do not claim that the above landmarks are not variable. We have only tried to reduce the margin of error.

Material and Methods

The process of uterine involution was studied in 812 cases at the S.S.G. Hospital, Baroda, from May 1964 to June 1965. The cases belonged to the following groups.

329 normal labour.

59 caesarean section and rupture uterus.

116 forceps, internal version, manual removal of placenta, etc.

127 antenatal complications-hydramnios, multiple pregnancy, antepartum haemorrhage, etc.

88 puerperal sterilization.

93 miscellaneous antenatal and intranatal complications.

The fundal height was recorded soon after the expulsion of the placenta whenever possible and in the postnatal ward subsequently at the interval of 24 hours. All records were made in the morning after the patient had evacuated the bowels and the bladder. The measurement was made with patient in the recumbent position with thighs flexed and a pillow under the head. The uterus was brought to the midline. All the measurements were recorded in centimetres. Oxytocic drugs are not used as a routine in our hospital. In patients with normal labour, breast feeding was established in 1-2 days. In patients with caesarean section and other operative deliveries, breast feeding was not satisfactorilly established because of prematurity, maternal ill-health, still-birth or neonatal death.

Analysis

The position of the fundus of the uterus soon after labour was analysed in 329 cases who had normal delivery. It is seen is Table I that the uterus was about 2.5 centimetres (1 inch) below the umbilicus in about 60 per cent of the cases. In 23.6 per cent of cases, it was halfway between umbilicus and sympthysis pubis. In only 10 per cent of cases was the fundus at the umbilicus soon after labour. Along with the fundal height, distance between umbilicus and symphysis pubis was also recorded every day till the uterus became impalpable. The results are recorded in Table II.

TABLE I

Size of the uterus soon after labour

Position of the uterus	No. of cases	Percentage
At the umbilicus	33	10
2.5 cms. above the umbilicus	20	6
2.5 cms. below the umbilicus	198	60
Midway between umbilicus and symphysis pubis	78	23.6

TABLE II

Involution of the anterior abdominal wall

Distance between umbilicus & symphysis pubis	No. of cases	Percentage
No change	90	27.4
Decrease to 1 cm.	100	30.3
Decrease to 2 cms.	95	28.9
Decrease to 3 cms.	44	13.4

We found that the distance between the symphysis pubis and the umbilicus was reduced in about three quarters of the cases as the involution proceeded. In other words we found that the anterior abdominal wall also undergoes a process of involution to a varying extent.

TABLE III

Type of Labour	No. of days for fundus to come midway		No. of days to sink in the pelvis		Percentage of normal size uterus at 6 weeks	
	A	B	A	B	A	B
Normal labour ,,	3.4	4.6	13.8	15.0	94.6	77.8
Caesarean and repair of rupture	13.4		22.4		65%	
Forceps, I.P.V., M.R.P.	5.9	7.6	16.0	19.7	92.1	85.7
Antenatal complications	4.2	4.9	15.4	15.6	94.1	92.9
Miscellaneous ..	6.0	7.7	18.1	20.6	90.9	76.5

A. Breast feeding. B. Not breast feeding.

Uterine involution in normal labour

Table III is very composite and self-explanatory. The fundus is midway between symphysis pubis and umbilicus in about 3.4 days in women who breast feed their babies, whereas it takes 4.5 days in women who do not breast feed. The uterus becomes impalpable in 13.8 days in women who breast feed whereas it takes 15 days in women who do not. The uterus returns to normal size at the end of six weeks in 94.6 per cent of cases who breast feed and in only 77.8 per cent of cases who do not.

Uterine involution after caesarean section and repair of ruptured uterus

Table III conslusively proves that the process of involution is considerably retarded in cases of caesarean section and after repair of the ruptured uterus. Large majority of mothers in this group were not breast feeding their babies and so the effect of breast feeding could not be ascertained. It took about 13.4 days to come midway and about 22.4 days to become impalpable. At the end of six weeks the uterus was of normal size in only 65 per cent of cases. We feel that any incision on the uterus retards the process of involution because the process of repair and involution have to go together. It is possible that for the first few days the process of repair takes precedence over the process of involution which starts later.

Involution in the rest of the cases

We found that the process of involution is better discused under the heading of involution in the first half and involution in the second half. The time taken for the uterus to become impalpable per abdomen is called the first half of involution and the time taken for the uterus to return to normal size after it has sunk in the pelvis is called the second half of involution. It is seen from Table III that in cases of forceps, internal podalic version and manual removal of placenta, it is only the first half of involution that is delayed whereas the second half of the involution is not significantly retarded as compared to normal. Hydramnios and multiple pregnancy retard the first half of the involution only.

Involution in puerperal sterilization

Puerperal sterilization does not significantly affect the process of involution. We perform the operation between 3 to 7 days after delivery and the process of involution has already started to a varying degree in these cases. Therefore, the first half of the involution could not be satisfactorily studied. However, the second half of the involution is unaffected because the uterus returns to the normal size at the end of six weeks in most of the cases.

Effect of parity on involution

Contrary to text-book teaching, our studies revealed that the process of uterine involution was rapid in parity II to IV and it slowed down beyond parity V. In primigravidae also the process of involution was slightly slower than in parity II to IV.

Effect of sepsis on involution

As there were very few cases of puerperal sepsis the effect on involution could not be satisfactority

studied. The process was delayed in the few cases we had of puerperal sepsis.

Summary and Conclusions

1. The uterus is below the umbilicus soon after labour in most of the cases.

2. The uterus takes about 3.4 days to come midway between umbilicus and symphysis pubis. In about two weeks the uterus becomes impalpable per abdomen.

3. Breast feeding influences the process of involution.

4. The process of involution is considerably retarded in cases of caesarean section and repair of ruptured uterus.

5. Intrauterine manipulations like version and manual removal of placenta retard the first half of involution but do not significantly affect the second half of involution.

6. Puerperal sterilization does not affect the involution process.

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