

**Course Name :An Overview on Maternal Health Antenatal, Intranatal and Postnatal Care**

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**Lecture:07**

### **Mechanism of Normal Labour (contd )**

Good morning students. Welcome you all to yet another session for the NPTEL online certified course on the topic and Overview on Maternal Health, the Antenatal, Intranatal and Postnatal Care. I am Doctor Barnali Ghosh, an Obstetrician and Gynecologist working as Assistant Professor at B.C.Roy Multispeciality Hospital and Medical Research Centre, IIT Kharagpur. So, we have been discussing the mechanism of normal labour, where we have already discussed the cardinal, the first cardinal movements that is the descent, you know the in first the engagement, then the descent, then flexion and internal rotation. And we have also seen the theories you know involved or theories which we know scientifically which scientifically explain the events of flexion as well as internal rotation. Now continuing with this flexion, flexion and internal rotation what happens due to this internal rotation of the head.

So, due to this internal rotation of the head, so you can see here. So, we have discussed that the internal rotation of the head will occur in such a way that this occiput, this is the occiput. So, the occiput was actually in the left occiputo anterior position. So, this occiput was in the left you know pointing towards the left iliopubic eminence right.

So, with internal rotation of the fetal head, this occiput will now rotate by one-eighth of a circle that is 45 degrees and such that the occiput comes behind the symphysis pubis. So, the head rotates, but to note that the shoulders, these are the shoulders, these are the shoulders. So, the shoulder there is no movement of the shoulders. So, the head rotates, head is rotating, but the shoulder there is no movement right. So, there is a torsion in the neck due to this internal rotation, there is a torsion in the neck and this neck can sustain a torsion of one-eighth of a circle not more than that.

So, if the rotation of the head was more than one-eighth of a circle as in case of LOT that is left occiput or transverse, where the occiput is towards the trans directed transversely. So, now, it has to move by two-eighth of a circle right by two-eighth of a circle or 90 degrees. So, that the occiput now becomes anterior and it hinges behind the symphysis pubis. So, at that time there will be a torsion in the neck by one-eighth of a circle and as because the neck cannot

sustain a torsion of more than one-eighth of a circle, there will be associated movement of the shoulders also by one-eighth of a circle for the extra one-eighth right. So, a torsion just to know that in left occiput anterior due to internal rotation of the fetal head by one-eighth of a circle, there is a torsion in the fetal neck right and so, that is the torsion of the neck.

Now coming back to the slides, so, there is a torsion in the neck and this is because of the internal rotation of the head right. Next what happens? Next is delivery of the head. So, delivery of the head. So, there is a phenomenon called as crowning. What is crowning? So, this is the occiput.

So, now, after the internal rotation the occiput is just behind the symphysis pubis right. So, this is the pubic symphysis occiput is behind the symphysis pubis and now with the pushing effect right. What is that pushing effect? The feet the uterus is contracting and it is pushing the fetus down and the perineal muscles the vaginal soft tissue all these will give a resistance all these will give a resistance and that will be an upward pressure as well as a forward pressure. This upward pressure negates the downward pressure of the fetal descent due to the uterine contraction. So, the downward and upward pressure will neutralize and the forward pressure will lead to the delivery of the head and what is crowning? Crowning is that phase when the biparietal diameter crosses the pelvic outlet and the vaginal the valvular outlet is you know is stretched by the fetal head and you can see the fetal head right.

And it is not receding back the fetal head is not receding back into the uterine cavity even during the period of uterine relaxation. So, that is crowning right and at this point of crowning episiotomy is to be given. So, next the after crowning the fetal head is delivered this is the delivery of the fetal head by the process of extension. So, the occiput will hinge below the pubic symphysis this is the pubic symphysis and gradually by the process of extension the fetal head was inflexion and now by the process of extension gradually the vertex the sinciput vertex the say this is the vertex this portion this is the sinciput this is the brow this is the chin. So, slowly slowly the vertex sinciput brow and chin is delivered right by the process of extension this is the delivery of the head.

Next is restitution. Restitution is in a direction opposite in a direction opposite to that of internal rotation of the head right thereby no this is due to untwisting of the neck. So, there was a torsion in the neck of one-eighth of a circle and this torsion is now relieved by the process of restitution and this process of restitution is in opposite direction to that of internal rotation and now the fetal head in case of left occiput anterior the fetal head will now look towards the maternal right thigh opposite thigh it was left occiput anterior and as restitution has occurred in a direction opposite to that of the internal rotation. So, it will look towards the right thigh of the mother right thigh of the mother obliquely. So, this is restitution, this is a passive movement just untwisting of the neck thereby relieving the torsion in the neck right.

So, this is what I was explaining internal rotation if it is 90 degree that is by two-eighth of a circle in case of L O T or occiput transverse position L O T or R O T. So, in the neck the torsion that is with the neck can withstand a torsion of one-eighth of a circle and the other one-eighth of a circle is corrected or is along with the rotation of the fetal shoulders right. So, after delivery the restitution occurs in a direction opposite to that of the direction of the internal rotation and this restitution is by one-eighth of a circle and other external rotation this is due to the internal rotation of the shoulders. We will come to this we will come to this. So, restitution you have understood it is due to the untwisting of the neck the torsion in the neck.

Next is external rotation I have told this is due to the internal rotation of the shoulders. Now, there will be the head is already delivered the shoulders need to be delivered the shoulders will now negotiate through the pelvic cavity the it will undergo rotation by one-eighth of a circle the anterior shoulder will come behind the symphysis pubis and making the anterior shoulder as the fulcrum right it will slide below the symphysis pubis and the posterior shoulder will be delivered by the process of lateral flexion right and the rest of the body will get delivered expulsion of the trunk or rest of the body will get delivered by the process of lateral flexion. So, these were all the steps of normal level. Now, I will show it one by one in this demo. So, we have this fetus and this is a case of longitudinal lie, cephalic presentation, presenting part being the vertex so that means, attitude is well flexed right.

So, attitude is well flexed presenting part being the vertex and denominator being the occiput and your position is left occiput anterior so that means, the occiput is behind the left ilio pubic eminence. But most commonly engagement occurs in left occiput transfers where the occiput is towards the transfers diameter right, but left occiput anterior is also common and we will discuss here the left occiput anterior. So, this is the position of the fetus. Now, as the labour onset starts there is engagement what happens the maximum biparietal diameter that or maximum transfers diameter that is the biparietal diameter crosses the pelvic brim right. It crosses the pelvic brim and the transfers diameter is in the right oblique diameter and the engaging anterior posterior diameter which is the suboccipitobregmatic is in the left oblique diameter.

Now, their engagement has taken place that is the biparietal diameter has crossed the pelvic brim. Now, with further uterine contraction and retraction there is further descent of the fetus right and then the fetal head will reach the pelvic floor the occiput will touch the pelvic floor and by the process of internal rotation by the process of internal rotation this occiput will move by one-eighth of a circle such that the occiput now comes behind the symphysis pubis right. You can see so, occiput now comes behind the symphysis pubis right. So, this is brought about by the internal rotation of the fetal head. Now, the shoulders the shoulders which were in the right oblique plane there is no movement of the shoulders, but due to this internal rotation there is a torsion in the neck by one-eighth of a circle right.

Now, with further descent with further descent the occiput will now come below the symphysis pubis right. So, occiput now comes below the symphysis pubis and by the process of extension what happens by the process here it there is some cephalopelvic disproportion. So, it is not being negotiated, but I will show you. So, now the head delivery will occur. So, now by the process of extension the first the occiput then the vertex then the symphysis pubis or the brow then the face and the chin is delivered by the process of extension.

So, this is the delivery of the head. After the delivery of the head what will happen the chin will just press against the maternal anal opening. After the delivery of the head by the process of extension now there will be restitution right. So, restitution will be in the direction opposite to that of internal rotation of the head thereby relieving the torsion in the neck right and it will be so that the fetal head now faces the right thigh of the mother obliquely right. So, that was the delivery of the head followed by restitution.

Now, the now you can see the shoulders the shoulders are in the right oblique diameter. Now, with further descent the anterior shoulder this is the anterior shoulder the anterior shoulder will touch the pelvic floor and by the same method it will rotate the anterior shoulder will rotate by one-eighth of a circle such that the anterior shoulder now comes behind the symphysis pubis and due to this internal rotation of the anterior shoulder. So, here the anterior shoulder is getting rotated and that will be manifested by the external rotation of the fetal head. The anterior shoulders are getting internally rotated by one-eighth of a circle and the head will rotate in the same direction as that of restitution by one-eighth of a circle thereby the fetal head is facing the right thigh of the mother directly. Now, the anterior shoulder is hinging behind the pubic symphysis acting as a fulcrum the posterior shoulder will slide against the perineum and it will be delivered by the process of lateral flexion.

The rest of the body of the fetus is delivered by the process of lateral flexion. So, that was the steps of normal labor and the different movements taking place within the fetus to adapt itself through the maternal pelvis right. So, coming back to our slides so, these are the diagram. So, here first engagement is taking place and see the engagement is taking place in posterior asynclitism position then it will be corrected as it is descending the fetal head is descending the posterior asynclitism is corrected and the head is now in synclitism position. With further descent there is rotation there is rotation and see now this bregma this bregma will go behind.

So, there is rotation and the occiput will come behind the symphysis pubis and there will be delivery of the fetal head by the process of extension right. So, just in a nutshell the steps of normal labor first engagement with engagement it goes down the pelvic brim the biparietal diameter cross the pelvic brim and with further descent there is increasing flexion with along with descent there is increasing flexion right due to the resistance given by the pelvic floor

muscle, the unfolding cervix as well as the birth canal right. So, there is increasing flexion next is internal rotation with after flexion there is internal rotation of the occiput and if it is more than one-eighth of a circle then there is simultaneous rotation of the shoulders because in the neck torsion can be withstood only up to 45 degrees that is one-eighth of a circle. Next there will be crowning and delivery of the head by extension following the delivery of the head the torsion in the neck will be corrected by restitution right. So, in the direction opposite to that of the internal rotation of the head.

Now, the external rotation of the head occurs which is actually due to the internal rotation of the shoulders and the shoulders now come you know in the anteroposterior diameter with the anterior shoulder coming just behind the pubic symphysis it will slide against the pubic symphysis and the posterior shoulder will be born right delivery of the shoulders and the trunk by the process of lateral flexion. So, this was the full detailed structure of mechanism of normal labor and in all this process descent occurs right from the start to the end the descent occurs and thereby the fetus is born out through the birth canal into the outside world. So, that was regarding the steps of normal labor just a pictorial diagram. So, this is the first part that is engagement getting taking place. So, here you see this is the pelvic brim and engagement is biparietal diameter crossing the pelvic brim right then there is descent there is descent there is descent and then there will be flexion and internal rotation internal rotation.

So, here you can see. So, there is flexion and this occiput, occiput is in the left occiput anterior. So, there will be internal rotation and this occiput will come you know anteriorly just behind the pubic symphysis. So, this is internal rotation of the head right. Next what happens there is delivery of the head by the process of extension right head is delivered and now what will happen there will be restitution thereby relieving the torsion in the neck and then there will be external rotation due to the internal rotation of the shoulders thereby the shoulders coming just below the pubic symphysis and the anterior shoulder will hinge below the pubic symphysis and the posterior shoulder and rest part of the body will be born by the process of lateral flexion. So, these are the cardinal movements occurring in case of normal labour.

So, that was all regarding the mechanism of labour references mostly have been taken from D.C. Dutta book of obstetrics Williams obstetrics 26th edition James book on high risk pregnancy and also the oxenford book on labour right. So, go through these books at least one at least once you give a reading to this chapter because this is very very important and you know to go for vaginal delivery in any obstetric patient you know you need to know these steps and if in any stage there is you know some deviation from this normal process of labour it is called as labour dystocia or abnormal labour and in that case intervention should be done right. So, if the fetal head is not in complete flexion it is you know extended somewhat it is it gets corrected right with the process of labour with uterine contraction with you know the adaptations of the fetus through the bird's canal they most of the abnormalities get corrected that will lead to the

process of vaginal delivery ultimately, but sometimes when it does not get corrected then we have to intervene and help in the delivery of a normal healthy fetus as well as a normal healthy mother at the end of the delivery. So, that was all thank you for your patient hearing and we will keep on discussing this intranatal care in our further classes. Thank you. .