Chapter 17
Comparing Bishop Score and Transvaginal Ultrasonographic Cervical Factors to Predict Labor Induction

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ABSTRACT

The excitement of being a mother and holding your child in your arms is also accompanied by increased stress levels, worry, and unpredictability of giving birth. Every labour develops individually, posing a unique set of obstacles for the mother to overcome, the partner to be amazed at, and the obstetrician to reflect on. Predicting when the labour pains will start after induction, how they will be associated with gradual cervical dilatation, and how they will end in a vaginal delivery is one of the issues that the pregnant lady, her family, and the attending obstetrician most frequently think about. Transvaginal ultrasonography is increasingly employed in obstetrics, particularly in the second and third trimesters when it is used to estimate the length of the cervical canal. Transvaginal ultrasound measurements of cervical length and the condition of the internal os of the cervix during the second trimester help define an inadequate cervix and aid in the choice to do a cervical encirclage.

1. INTRODUCTION

The process of giving birth is accompanied with feelings of anxiety, stress, anticipation, and uncertainty; nonetheless, motherhood is a joyful experience overall, and the delight of meeting one's new baby comes hand in hand with these feelings (Bahn, 1998). Every woman's labor progresses in her own individual manner, with each stage presenting a new set of challenges for the lady to face, as well as questions and

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concerns for the woman's relatives and the obstetrician to ponder (Bartha et al., 2005). One of the most difficult questions for an expecting mother, her family, and the treating physician to answer is when labor pains will begin following an induction of labor, how they will correlate with cervical dilation, and whether or not a vaginal birth will occur as a result. Predicting when labor pains will begin after induction is one of the most difficult things to do (Chandra et al., 2001).

1.1. Anatomy and Physiology of The Cervix

There are several transformations that occur in the cervix throughout pregnancy and birth. Labor is the process through which the fetus is delivered to the outside world after spending its whole life within the uterus (Elghorori, et al., 2006).

1.2. Anatomy

The cervix is a tube that is hollow and stretches into the vagina to produce fornices. This process takes place throughout pregnancy (Rozenberg et al., 2005). It measures between two and three centimeters in length (12) and has two sets of minute openings on either end. These openings, known as the internal and external ora, are connected by the endocervical canal (Suganthi & Sathiaseelan, 2023). It is composed of two pieces, one that is located above the vaginal opening and one that is located below it (both of which are technically the portio vaginalis). The peritoneum encircles the supravaginal region and surrounds it from behind. Women who have had several children have a longitudinal slit rather than the circular external os that nulliparous women have. When speaking of the uterus, the term "flexion" refers to the angle produced between the long axis of the corpus and the cervix, whereas the term "version" refers to the angle formed by the uterus's junction with the upper vagina. Both terms are used interchangeably. The lining of the endocervix is made up of columnar epithelium, while the lining of the ectocervix is made up of stratified squamous epithelium (Cirillo et al., 2023). The lower uterine segment at term develops from the isthmus, which is the area between the anatomical internal os and the histological internal os. Because of this, the lower uterine segment at term has a special relevance in obstetrics (Chandra, 2001).

In the cervix, the smooth muscles, fibroblasts, and blood vessels are embedded in an extracellular matrix made up of collagen (type I (70%) and type III (30%)), elastin, and proteoglycans. The tensile strength of collagen is best preserved in fibers longer than 20 meters in length (Pandit 2023). The structure of collagen is a triple helix (Anand et al., 2023). It may form fibers, bundles, and fibrils by cross-linking. The human cervix contains the tiny molecular-weight proteoglycan decorin, which plays a role in the formation of collagen (Vashishtha & Dhawan, 2023). During pregnancy, cervical cells create a substance called decorin. There is a disorder of the collagen fibers as the decorin to collagen ratio rises, since this leads to a scattering of the collagen fibrils (Vashishtha et al., 2020). Collagenases break down collagen to gradually weaken the collagen matrix and permit cervical dilatation during a medical abortion (Verhoeven et al., 2012).

Bands of elastin, 20-30 m in thickness, run parallel to the collagen fibers. They are incredibly elastic, and under mechanical stress, the cervix may dilate to double its normal size.

Along its length, the cervix varies in the proportion of connective tissue to smooth muscle. Connective tissue makes up a larger percentage of the distal section than smooth muscle does in the upper cervical region near the myometrium.