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The second stage of labor commences as the cervix is fully dilated and ends with delivery of the fetus. Prolonged second stage of labor is associated with increased maternal and neonatal morbidity. Multiple factors were reported to influence the length of the second stage of labor such as parity, neuraxial analgesia, birth weight, occiput position, and fetal head station at complete dilatation. However, the great mystery of obstetrics which women will deliver safely and which will suffer a prolonged, obstructed course of labor remains unsolved.

According to the ACOG practice bulletin published in 2014 [1], for multiparous women the maximal length allowed for the second stage of labor is 2 and 3 h without and with neuraxial analgesia, respectively. For nulliparous women, the second stage can be extended to 3 and 4 h without and with neuraxial analgesia, respectively, if the fetal head persists to descend within the birth canal.

Therefore, within the particular group of women who experience a prolonged course, optimal management of the second stage of labor in attempt to reduce the rate of instrumental and cesarean deliveries and avoid adverse maternal and fetal outcome is significantly affected by accurate diagnosis of fetal head station and fetal head descent.

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33.1 Digital Examination During the Second Stage of Labor

Currently, the pelvic digital examination is considered the “gold standard” for assessing fetal head station and progression of labor. Unfortunately, digital examination is subjective to errors, and accuracy might be compromised by examiners’ experience, the presence of caput succedaneum, and other factors. The consequences of these errors may be those associated with complicated instrumental deliveries or those associated with second stage cesarean delivery.

The continuing search for an objective bedside real-time obstetric diagnostic tool for assessment and management of labor led to the introduction of ultrasound machines into the delivery rooms and to a large number of reports regarding the value of various sonopelvimetric parameters in the prediction of dysfunctional labor and unplanned operative delivery.

Sonographic imaging during the second stage of labor either by transabdominal (Fig. 33.1) or by translabial (Fig. 33.2) sonography enables assessment of fetal head position and fetal head station as well as the dynamic movements of the fetal head within the birth canal.

33.2 Fetal Head Position

Intrapartum assessment of fetal head position is essential in the management of the second stage of labor. Persistent occiput posterior position is associated with a higher rate of prolonged second stage of labor, operative delivery, and maternal and perinatal morbidities. Accurate identification of fetal head position aids in assessment of the normal and abnormal labor course and in the decision-making process whether to intervene medically or operatively. Diagnosis of head position is traditionally performed by digital vaginal exam; however, an error rate of 12% using a birth simulator

Fig. 33.1 Transabdominal technique for intrapartum ultrasonography in first stage of labor. Longitudinal scan showing the fetal head in Anterior Occiput Position (AOP)

