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Concept of Fetal Station Based on the Trapezoidal Plane (T-Station)

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Proper Positions for Vacuum Extraction and Forceps Delivery

To perform vacuum extraction, it is important to estimate before the leading portion of the fetal head circumference are engaged for judging whether the vacuum extraction or forceps delivery is correctly estimated. forceps would be used on the fetus without proper positioning for forceps delivery, resulting in a failed forceps delivery or fetal injury. If the fetus is correctly estimated to be not in the proper position for forceps delivery, cesarean section should be the procedure of choice. It is important to ensure that this assessment is performed objectively and the same assessment can be shared with other operators. Accurate assessment of fetal head descent and knowledge regarding the method, as well as education and knowledge succession for the use of forceps techniques, will assure successful, safe, and steady performance of forced delivery.

When a worsening trend is observed through fetal heart rate monitoring and non-reassuring fetal status is thus suspected, the decision as to when the fetus reaches the proper position for forceps delivery and whether the fetus can be extracted with safety largely depends on the extensive experience of the operator. Therefore, it is reasonable for the standards establishing the proper position for forceps delivery to vary between experienced and inexperienced operators. The first priority is safe and secure implementation of the procedure.

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In Japan, it seems that some operators of vacuum extraction delivery perform the vacuum extraction above station 0. However, in the case of forceps delivery, there is no concept of conducting a trial, then between implementation of forceps delivery and implementation of cesarean section without forceps procedure is applied, the fetus should definitely be extracted, although there are some very rare cases in which the forceps procedure is switched to cesarean section due to failure of the forceps delivery. The state in which the fetal head is engaged is station -1 to $+0$, as will be described later. Because this position is too high even for forceps procedures with a strong traction force, vacuum extraction of the fetal head in this position is necessarily prolonged due to the time needed for expulsion of the fetus, and the procedure carries risk when rapid extraction is necessary due to a non-reassuring fetal status. As prescribed in the American College of Obstetricians and Gynecologists (ACOG) guidelines, setting the requirement for vacuum extraction and forceps delivery at station $\geq +2$ is deemed appropriate [1].

Largest Fetal Head Circumference

Important diameters of the fetal head include the suboccipitobregmatic, anteroposterior, and mento-occipital diameters, and their respective circumferences are also important (Fig. 1). ACOG focuses on the distance between the biparietal diameter and the lowest part of the fetal head, because the cross section containing the biparietal diameter is consistent with the suboccipitobregmatic circumference. On the other hand, the method of the University of Tokyo places importance on the distance between the circumference and the lowest part of the fetal head, taking into account its flexion and deflexion status.