

Abstract

Obstetrical intervention's goal is to normalize an abnormal or pathological course of labour. In a certain case (e.g. fetal distress) this is not fully achievable. Then the goal is to accelerate the delivery without inadequate increase of risk of maternal or neonatal trauma.

The aim of this dissertation thesis was to offer an up-to-date definition and to outline a proper performance of these interventions. Therefore, it was necessary to properly and timely describe the labour layout in which the accoucheur and/or the parturient happen to occur when an intervention is to take place. It was essential to describe the quantity of perineal loading as well as to define the main vector of perineal strain and deformation.

Based on the range of this deformation it was subsequently possible to adequately describe and execute some obstetrical interventions (e.g. a variety of types of episiotomy) or to evaluate a variety of modifications by means of computational modelling (e.g. manual perineal protection) that might have so tiny nuances between each other or differences that are difficult to measure because the clinical evaluation is impossible due to interindividual imprecision or very short duration of the intervention.

We described the maximum strain on the perineal surface during vaginal delivery that happens to be in transversal direction in the posterior fourchette. We also were able to quantify this maximum strain reaching 177%, thus more than four-fold higher than in antero-posterior direction. This study filled some gaps to facilitate a production of a digital perineal model and brought new data to simulate the delivery in order to select a suitable modification of manual perineal protection in order to decrease/disperse the maximum perineal strain.

When comparing two types of episiotomy we showed that when properly executed the mediolateral and lateral episiotomy are comparable in many outcomes. The risk of anal sphincter trauma is low and comparable. The speed of healing, healing disorders and perineal pain do not differ. When an adequate episiotomy repair is performed there is a very small proportion of dehiscences or other healing disorders. Sexuality and subjective esthetic evaluation as well as anal incontinence are also comparable between mediolateral and lateral episiotomy up to six months postpartum. This is true also in case, that an episiotomy is performed at the latest moment, i.e. during the crowning of the perineum. This helps us to reduce the number of episiotomies to the minimum truly required.

By means of computational model of the perineum and fetal/neonatal head we showed that the perineal strain can be decreased throughout the full thickness of the perineal body. The optimum modification of initial thumb and index-finger placements and their subsequent movements was found and described.

Our work improved the knowledge, definition and execution of obstetric interventions and its relation to pelvic floor disorders.

Key words: anal incontinence, anal sphincter trauma, dyspareunia, episiotomy, healing complications, manual perineal protection, obstetrical trauma, perineal pain, sexuality.