Atraumatic normal vaginal delivery: how many women get what they want?


Abstract

BACKGROUND: Trauma to the perineum, levator ani complex, and anal sphincter is common during vaginal childbirth, but often clinically underdiagnosed, and many women are unaware of the potential for long-term damage.

OBJECTIVE: In this study we use transperineal ultrasound to identify how many women will achieve a normal vaginal delivery without substantial damage to the levator ani or anal sphincter muscles, and to create a model to predict patient characteristics associated with successful atraumatic normal vaginal delivery.

STUDY DESIGN: This is a retrospective, secondary analysis of data sets gathered in the context of an interventional perinatal imaging study. A total of 660 primiparas, carrying an uncomplicated singleton pregnancy, underwent an antepartum and postpartum interview, vaginal exam (Pelvic Organ Prolapse Quantification), and 4-dimensional translabial ultrasound. Ultrasound data were analyzed for levator trauma and/or overdistention and residual sphincter defects. Postprocessing analysis of ultrasound volumes was performed blinded against clinical data and analyzed against obstetric data retrieved from the local maternity database. Levator avulsion was diagnosed if the muscle insertion at the inferior pubic ramus at the plane of minimal hiatal dimensions and within 5 mm above this plane on tomographic ultrasound imaging was abnormal, ie the muscle was disconnected from the inferior pubic ramus. Hiatal overdistensibility (microtrauma) was diagnosed if there was a peripartum increase in hiatal area on Valsalva by >20% with the resultant area ≥25 cm². A sphincter defect was diagnosed if a gap of >30 degrees was seen in ≥4 of 6 tomographic ultrasound imaging slices bracketing the external anal sphincter. Two models were tested: a first model that defines severe pelvic floor trauma as either obstetric anal sphincter injury or levator avulsion, and a second, more conservative model, that also included microtrauma.

RESULTS: A total of 504/660 women (76%) returned for postpartum follow-up as described previously. In all, 21 patients were excluded due to inadequate data or intercurrent pregnancy, leaving 483 women for analysis. Model 1 defined nontraumatic vaginal delivery as excluding operative delivery, obstetric anal sphincter injuries, and sonographic evidence of levator avulsion or residual sphincter defect. Model 2 also excluded microtrauma. Of 483 women, 112 (23%) had a cesarean delivery, 103 (21%) had an operative vaginal delivery, and 17 (4%) had a third-/fourth-degree tear, leaving 251 women who could be said to have had a normal vaginal delivery. On ultrasound, in model 1, 27 women (6%) had an avulsion and 31 (6%) had a residual defect, leaving 193/483 (40%) who met the criteria for atraumatic normal vaginal delivery. In model 2, an additional 33 women (7%) had microtrauma, leaving only 160/483 (33%) women who met the criteria for atraumatic normal vaginal delivery. On multivariate analysis, younger age and earlier gestation at time of delivery remained highly significant as predictors of atraumatic normal vaginal delivery in both models, with increased hiatal area on Valsalva also significant in model 2 (all P ≤ .035).

CONCLUSION: The prevalence of significant pelvic floor trauma after vaginal child birth is much higher than generally assumed. Rates of obstetric anal sphincter injury are often underestimated and levator avulsion is not included as a consequence of vaginal birth in most obstetric text books. In this study less than half (33-40%) of primiparous women achieved an atraumatic normal vaginal delivery.

KEYWORDS: birth trauma; levator avulsion; obstetric anal sphincter injury; pelvic organ prolapse; ultrasound