

## Obstetric Fistula in the United States

From time to time we get inquiries about the occurrence of obstetric fistulas in the United States. Obstetric trauma occurs all over the world; no country is immune from this problem, but the nature and scale of the problem is vastly different in affluent countries such as the United States and Western Europe and the resource-poor nations of sub-Saharan Africa, south Asia, and elsewhere.

A *fistula* is an abnormal opening between two bodily structures that normally are not connected with one other. The most common fistulas are *genito-urinary fistulas* (involving an opening between the urinary tract and the vagina) and *recto-vaginal fistulas* (in which an abnormal passageway opens between the rectum and the vagina).

The most common genito-urinary fistula is a *vesico-vaginal fistula* (an opening between the bladder and the vagina), but other forms of genito-urinary fistula are possible: *uretero-vaginal fistula* (in which the passageway is between the ureter—the tube that brings urine down from the kidney to the bladder—and the vagina; a *urethro-vaginal fistula* (where the opening is between the urethra and the vagina) and so on. In industrialized countries such as the United States, genito-urinary fistulas do occur, but here they result from injuries during surgery (mainly hysterectomy), from cancer, or from radiation treatment. In the United States, vesico-vaginal fistulas from obstetric trauma are quite rare.

If we leave aside complications of cancer and radiation therapy, there are two primary mechanisms by which a fistula can form: a *crush injury* from obstructed labor or a *laceration* (a “tear”) of otherwise healthy tissues. These two causes are very distinct from one another. They are different in the way in which the injuries occur, different in the clinical settings in which the injuries happen, and different in the implications that the injuries have for subsequent treatment and recovery.

Obstructed labor occurs when the fetus will not fit through its mother’s pelvis. The descent of the fetal head (or other presenting part) stops when the space available for its passage becomes too narrow. The unrelenting contractions of the uterus during labor force the fetal head deeper into the pelvis, and when forward progress stops, the mother’s soft tissues are trapped between the fetal head and her pelvic bones. If this pressure is not relieved in a timely fashion (something which requires skilled obstetric intervention), it will eventually reach a point where it cuts off the blood supply to the entrapped tissues. When this happens, the crushed tissues die from lack of oxygen. Eventually, they slough away to create a vesico-vaginal fistula. Depending on what soft tissues are impacted, sometimes the affected woman also develops a recto-vaginal fistula. In the worst situations, she develops *both* a vesico-vaginal and a recto-vaginal fistula. In these cases the continuous loss of urine from the injured bladder mingles with feces and gas coming through the vagina from the rectum, making these women miserable indeed.

The mechanism of injury (pressure necrosis) often leads to a lot of other problems in women who have sustained an obstetric crush injury of this kind. The tissues where the fistula develops are dead and gone (hence, the fistula); but the tissues surrounding the fistula are generally not normal, either. These surrounding tissues have also been crushed and have consequently lost some of their blood supply; but they have survived. They are alive but they are not healthy; they remain injured, but healing. Often dense bands of scar tissue form in this area, reducing vaginal capacity and mobility. Often other surrounding organs are also damaged, leading to what has been called the “obstructed labor injury complex.”<sup>1</sup>

The important thing to understand is that obstructed labor produces a broad field injury in which the affected tissues are crushed and asphyxiated. Obstructed labor does not produce a “tear” or a “laceration” of the bladder or urinary tract. The accompanying table gives the reader an idea of the spectrum of damage that a labor lasting three, four or five days can produce through crush injuries of this kind. In resource-poor countries, these injuries are widespread and commonplace.

Obstetric crush injuries from obstructed labor used to occur in the United States in the 19<sup>th</sup> Century, when our medical system was rudimentary and poorly developed and when surgical operations were risky, relatively difficult to obtain, and often were unsuccessful. The first hospital in the world devoted exclusively to the care of fistula patients was opened in New York City in 1855—but developments in medical care eventually made it obsolete. Today, obstetric fistulas arising from the crush injuries produced by prolonged obstructed labor are virtually unknown in the United States. Labors do not last four or five days; and cesarean section is readily available almost everywhere in the country. If a genito-urinary fistula develops during labor or delivery in the United States today, it is almost always the result of a surgical complication during cesarean section, not an obstetric crush injury of the type found in sub-Saharan Africa.

The acute injury that arises as a surgical complication during cesarean delivery or hysterectomy is fundamentally different from the crush injury that arises from obstructed labor. Surgical injuries (or acute lacerations) are discrete injuries occurring to healthy tissues, not tissue necrosis that occurs over a wide area of the pelvis from obstructed labor. Such acute injuries are far less complicated to fix than the crush injuries seen in sub-Saharan Africa from obstructed labor. The vastly greater access to high quality medical care found in the United States also means that injuries of this kind are usually treated promptly and effectively. There is no backlog of tens of thousands of women with fistulas who cannot access care. Sadly, however, some of these surgical injuries do not heal well and some women are left with ongoing problems.

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<sup>1</sup> Arrowsmith S, Hamlin EC, Wall LL. “Obstructed labor injury complex:” Obstetric fistula formation and the multifaceted morbidity of maternal birth trauma in the developing world. *Obstetrical and Gynecological Survey* 1996;51:568-574.

Recto-vaginal fistulas can also occur through the two different mechanisms described above: a crush injury from prolonged obstructed labor or an acute laceration occurring at delivery. Recto-vaginal fistulas can also occur from cancer, from radiation therapy, and from inflammatory bowel disease (such as Crohn's Disease). The most common reason that a recto-vaginal fistula occurs in the United States today is traumatic vaginal delivery.

Ano-rectal injuries during delivery commonly involve either the anal sphincter (the muscle that holds the anus closed) or the recto-vaginal septum (the tissues separating the rectum from the vagina), or both. Crush injuries to the anus and rectum from prolonged obstructed labor are extremely rare, because of the well-developed maternal health care system in this country. Most commonly obstetric ano-rectal injuries in the United States occur from a rapid, uncontrolled delivery ("precipitous delivery"), from a shoulder dystocia (where the baby's head is delivered, but the shoulders become stuck behind the pubic bone ---an obstetric emergency that can easily lead to fetal death or serious injury if not immediately corrected), or a prolonged second stage of labor which requires operative assistance using either forceps or a vacuum extractor to effect delivery. Performance of an episiotomy increases the likelihood of a tear occurring which extends into the anal sphincter or rectum; sometimes such incisions are necessary to accomplish delivery.

Anal sphincter injuries are classified as first, second, third, or fourth degree tears. The more severe (deeper) lacerations are "third degree" tears (in which the sphincter muscle is partially torn) and "fourth degree" tears (in which the entire sphincter muscle is torn and the laceration extends into the rectum itself). These injuries are rare and due to the circumstances in which they occur (e.g., shoulder dystocia) sometimes they are unavoidable. The vast majority of these lacerations can be repaired successfully at the time of delivery; but a small number (perhaps 10%) of fourth degree (complete) lacerations break down, leading to the formation of a recto-vaginal fistula. Occasionally a recto-vaginal fistula can occur as a separate injury from a tear above the anal sphincter (a so-called "buttonhole" laceration). If these injuries are detected at the time of delivery and are repaired appropriately, they should heal well.

The most recent study of third and fourth degree obstetric lacerations showed that they were uncommon. Alexander Friedman and colleagues examined delivery data from over 7 million women who underwent a vaginal delivery in the United States at over 3,070 hospitals between 1998 and 2010.<sup>2</sup> Of these 7,096,056 deliveries, 3.3% were complicated by a third-degree tear and 1.1% had a fourth-degree laceration. The authors of this study also identified a steady *decrease* in the rate of lacerations over the time-period studied. For third-degree lacerations the rate declined from 4.0% to 2.5% and for fourth-degree lacerations the rate declined from 1.7% to 0.6%. (Remember, laceration rates are *not* the same as obstetric fistula rates, but they are the background against which obstetric fistulas arise).

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<sup>2</sup> Friedman AM, Ananth CV, Prendergrast E, D'Alton ME, and Wright JD; "Evaluation of third-degree and fourth-degree laceration rates as quality indicators;" *Obstetrics and Gynecology* 2015;125:927-937.

The authors concluded that the majority of risk factors related to a third or fourth degree laceration were not preventable. The major risk factors for such injuries are forceps delivery with or without episiotomy, delivery with a vacuum extractor with or without episiotomy, shoulder dystocia, fetal distress (requiring prompt delivery to protect the life and health of the baby) and long labors (which is not the same as prolonged obstructed labor). The vast majority of the hospitals in this analysis “had adjusted laceration rates that were statistically indistinguishable ... precluding meaningful comparisons between different institutions.”<sup>2</sup> This means that the laceration rates around the country are very uniform from hospital to hospital. As a result, the authors of this paper concluded that use of third- and fourth-degree laceration rates as a measure of obstetric quality control would not be useful because “the main determinants of laceration risk were nonmodifiable obstetric complications and operative delivery.”<sup>2</sup> In short, these lacerations are largely the result of unpredictable emergency obstetric circumstances, with little room for modification or improvement.

Could some of these injuries have been avoided? In some cases, perhaps: the trend in American obstetrics over the last several decades has been towards decreasing rates of episiotomy and decreasing rates of operative vaginal delivery—but in most of the circumstances described the only alternative to vaginal delivery with forceps or a vacuum extractor would have been cesarean section, and in many cases cesarean delivery would have been impractical (take too long), impossible (due to the obstetric situation), or unindicated (too risky or otherwise inappropriate). A recent analysis of the cost-benefit ratio of elective cesarean section to reduce obstetric anal sphincter injuries demonstrated that it would require five elective cesarean deliveries to prevent a single anal sphincter laceration.<sup>3</sup> This is an unacceptably high price to pay as a policy choice.

Cesarean section is generally a safe operation, but it carries significantly greater risk than vaginal delivery. Cesarean section is a major abdominal operation, with significantly increased risks of wound infection, hemorrhage, blood clots, injuries to other organs, wound breakdown, and even death when compared to vaginal delivery. The presence of a cesarean section scar also increases the risk of placental implantation abnormalities, uterine rupture, and other complications in a subsequent pregnancy, labor and delivery. These are not trivial risks and they should not be assumed without adequate reason. A policy of indiscriminate cesarean delivery to avoid potential anal sphincter injuries and the small associated risk of recto-vaginal fistula is not justifiable.

Several years ago a group of British obstetricians carried out a similar study in which they compared women who sustained a third- or fourth-degree laceration with women who had delivered vaginally without incurring such an injury, matched by both

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<sup>3</sup> Minaglia SM, Kimata C, Soules KA, Pappas T, and Oyama IA; Defining an at-risk population for obstetric anal sphincter laceration; *American Journal of Obstetrics and Gynecology* 2009;201:526.e1-6.

maternal and gestational age (a case-control study).<sup>4</sup> The authors were unable to develop a way of predicting who would sustain an obstetric sphincter laceration (and hence, who would be at risk for the development of an obstetric recto-vaginal fistula). They concluded that in the absence of the ability to make such predictions, it would be better “to accept that obstetric anal sphincter injury is neither predictable nor preventable” and that it was better “to optimize outcome after repair.”<sup>4</sup>

In short, the best way to deal with the problem of ano-rectal injuries resulting from vaginal delivery is better training of obstetricians in the detection of ano-rectal injuries after delivery, and better training in how to repair them. The establishment of specialized perineal trauma clinics at academic tertiary care medical centers and improved access to specialist surgical consultation on labor and delivery wards might help improve standards of treatment for these relatively uncommon problems.

Acute anal sphincter lacerations and recto-vaginal fistula formation can never be completely eliminated as long as women deliver babies through the vagina. A policy of universal cesarean section to avoid such injuries is unworkable and would result in higher rates of morbidity and mortality than that which would be prevented by altering the path of delivery. Fortunately, severe ano-rectal injuries from delivery are relatively rare in the United States and other developed regions of the world. No affluent country has a backlog of tens of thousands of obstetric fistula cases who are unable to find care as is the case in the impoverished nations of the world.

**[Organization]** is dedicated to helping women in **[geographic location]** with obstetric fistulas. We do not provide either care or referral for women with obstetric injuries in the United States. We suggest that women with such injuries seek help from a board-certified urogynecologist. To find a certified specialist in Female Pelvic Medicine and Reconstructive Surgery (“urogynecology”) we suggest contacting the American Urogynecology Society ([www.augs.org](http://www.augs.org)).

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<sup>4</sup> Williams A, Tincello DG, White S, Adams EJ, Alfirevic Z, and Richmond DH; Risk scoring system for prediction of obstetric anal sphincter injury; BJOG: An International Journal of Obstetrics and Gynaecology 2005;112:1066-1069.

**Table. Spectrum of Injuries in Occurring From Prolonged Obstructed Labor in Developing Countries (The “Obstructed Labor Injury Complex”)**

Acute Obstetric Injury

- Hemorrhage, especially post-partum hemorrhage
- Intrauterine infection and/or systemic sepsis
- Deep venous thrombosis
- Massive vulvar edema
- Uterine rupture

Urologic Injury

- Genito-urinary fistulas (vesico-vaginal fistula and complex combinations of injuries)
- Urethral damage, including stress incontinence and complete loss of the urethra
- Bladder stone formation
- Upper urinary tract injury and infection (hydro-uretero-nephrosis and chronic pyelonephritis)
- Kidney failure

Gynecologic Injury

- Cessation of menstruation (amenorrhea)
- Vagina scarring and narrowing, leading to loss of sexual capability
- Damage to the cervix, including complete loss of the cervix
- Pelvic inflammatory disease
- Infertility and childlessness

Gastrointestinal Injury

- Recto-vaginal fistula from pressure necrosis
- Scarring and narrowing of the rectum
- Associated anal sphincter injury and anal incontinence

Musculoskeletal Injury

- Inflammation and injury of the pubic bone
- Diffuse trauma to the muscles of the pelvic floor

Neurological Injury

- Foot-drop from lumbosacral plexus/peroneal nerve injury
- Neuropathic bladder dysfunction

Dermatological Injury

- Chronic excoriation of the skin from maceration by urine and feces

Fetal/Neonatal Injury

- Over 90% stillbirth rate
- Neonatal asphyxiation, infection and birth injuries with increased neonatal death rates

Psycho-Social Injury

- Psycho-social injury, markedly diminished feelings of self-worth, post-traumatic stress disorder
- Severe social stress, leading to separation, divorce, worsening poverty