

Botulinum Toxin Therapy for Vulvodynia

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Introduction

Botulinum toxin has evolved from a feared poison to a wonder drug of modern medicine. Almost everyone is aware of its cosmetic use in reducing facial wrinkles and signs of aging, but it is much more than an indulgence for those seeking to stay young. The possible therapeutic benefit of botulinum toxin is being investigated for literally hundreds of medical conditions. The National Institutes of Health currently list 66 active clinical studies assessing the efficacy of botulinum toxin. How is it possible for one naturally occurring chemical to have so many different applications? The answer is that botulinum toxin has a titratable (dose related) effect on the cholinergic and autonomic nervous system, thereby exerting an influence on skeletal muscle, smooth muscle and vis-

cera. Most medical maladies will involve at least one of these systems and cause symptoms that may be amenable to treatment with botulinum toxin.

Vulvodynia is defined as vulvar discomfort in the absence of gross anatomic or neurologic findings. The patient typically describes sensations of burning, irritation and rawness. It is estimated that as many as 15 percent of women will experience vulvodynia at some point in their lives. The precise etiology of vulvodynia is unknown, but it is likely the end result of multiple factors; consequently, prescribed treatments typically involve a multimodal approach. Vulvodynia experts generally agree that pelvic floor pain and neuropathic

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Childbirth Practices and Women with Vulvodynia

By Andrea Hall

Andrea Hall is an editor, NVA Executive Board member, and the mother of two young boys. She has done extensive research on pregnancy and childbirth.

Most pregnant women with vulvodynia are brimming with questions about the possible effect of labor and childbirth on vulvar pain. This article covers aspects of labor and childbirth that may be especially challenging for women with vulvodynia and encourages discussion of these issues beforehand with an obstetrician or midwife. For our purposes, we will use the word doctor in referring to a pregnant woman's health care provider, but we recognize that some women may prefer to use a midwife.

Childbirth Options

In consultation with her doctor, a pregnant woman who suffers from vulvodynia can choose either a

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pain are common components of vulvodynia. Botulinum toxin may play a unique role in the treatment of vulvodynia because it has efficacy against both of these pain generators.

History

Botulinum toxin is possibly the most potent biologic toxin in the world. It is estimated that 100 grams would be enough to kill every human being on earth. The spores of this toxin occur in nature and can be found in practically all of the soil on earth. Fatalities associated with botulism are usually the result of toxin absorption through the gut from contaminated food and the resultant systemic neuromuscular blockade resulting in flaccid paralysis and death. (This is in contrast to the neurotoxin associated with tetanus that causes a spastic paralysis.)

Justin Kerner, a German physician and poet, first

recognized the effect of botulinum toxin and called it “sausage poison” because it was associated with badly handled or prepared meat. The term botulism, from Latin *botulus* = “sausage,” was coined by Muller in 1870. In 1895, the bacterium *Clostridium botulinum* was isolated, and in 1944, the first toxin was isolated. Five years later, it was discovered that this botulinum toxin blocks neuromuscular transmission. In 1973, Alan B. Scott, MD used botulinum toxin type A (BTX-A) in experiments with monkeys and then, in 1980, he used it for the first time on humans to treat strabismus (eye misalignment due to muscle imbalance). In 1989, the US Food and Drug Administration (FDA) approved BTX-A for the treatment of strabismus and blepharospasm (spasm of the eyelid muscle). Between 2000 and 2004, the FDA approved BTX-A for cervical dystonia (painful muscle contractions in the head and neck), cosmetic use and the treatment of axillary hyperhidrosis (excessive sweating).

There are seven serologically distinct botulinum toxin types that have been isolated, designated A, B, C, D, E, F and G. For clinical use, only toxin types A and B are commercially available. In the United States, BTX-A is known as Botox (Allergan, USA). In Europe and other countries, BTX-A is marketed as Dysport (Ipsen Ltd, UK). Botulinum toxin type B (BTX-B) is commercially available as Myobloc or Neurobloc (Solstice Neurosciences, USA). It is important to know that these botulinum toxins are all produced from different strains of the bacterium *Clostridium botulinum*. All these toxins differ in potency and dose, and therefore are not interchangeable. It is estimated that 1 U of Botox is equivalent to 3 – 5 U of Dysport or 50 U of Myobloc.

Mechanism of Action

Botulinum toxin causes a chemical denervation that can affect both skeletal and smooth muscle. It has a high affinity for, and binds with, cholinergic nerve endings such as those at the neuromuscular junction and in the autonomic nervous system. It then inhibits the release of the neurotransmitter acetylcholine, which interferes with the nervous

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The National Vulvodynia Association is an educational, nonprofit organization founded to disseminate information on treatment options for vulvodynia. The NVA recommends that you consult your own health care practitioner to determine which course of treatment or medication is appropriate for you.

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impulse, resulting in muscle relaxation. The nerves affected by the toxin do not degenerate and in time reinnervation of the muscle occurs by axonal sprouting and the formation of new synaptic contacts (nerve connections regenerate). The degree and duration of muscle paralysis is dependent on the type of toxin and the dosage. In clinical usage, the desired effect is to induce normal muscle tone, but not complete paralysis. The hope is that, as the nerve recovers, whatever initiated the hypertonicity (high muscle tension) will not recur.

Botulinum toxin also appears to have an antinociceptive (pain-reducing) effect separate from its neuromuscular action. It has been used to treat painful conditions such as headache, torticollis, myofascial pain and interstitial cystitis. It is postulated that the nociceptive neuropeptide substance P, calcitonin gene-related peptide and other mediators of pain and inflammation are prevented from being released at the nerve ending by the same mechanism that prevents the release of acetylcholine. In vitro and in vivo testing on animal models have demonstrated the inhibition of the various neurotransmitters known to be associated with pain. Evidence suggests that by blocking peripheral sensitization and afferent pain signals one can reduce the central sensitization associated with chronic pain.

When botulinum toxin is injected intradermally (into the skin), it inhibits glandular secretion by inhibiting the release of acetylcholine, the neurotransmitter that activates peripheral sweat glands. Consequently, it is an effective therapy for reducing excessive sweating and has been injected into the armpit, palm and plantar surfaces.

When botulinum toxin is injected into muscle, the onset of action is dependent on the size of the muscle, the dosage and concentration of the toxin, and the size of the area being treated. Facial muscles will show an effect within one to two days, but larger muscles may take up to two weeks to show improvement. The paralysis can last up to three months, but the return of muscle function is gradual so the functional result may last up to six months or longer. Subsequent treatments are individualized according to the patient's response and there may be some additive effect with additional injec-

tions. Botulinum toxin is a biologic and therefore potency may vary from lot to lot. The response to treatments can vary within the same patient and it may be related to the particular lot of toxin or even to how it was reconstituted. In non-responders, a second treatment may be warranted before abandoning the treatment.

Contraindications, Side Effects and Safety

Botulinum toxin is contraindicated if the individual has a known hypersensitivity to any ingredient in the formulation and it should not be used at the site of an active infection. For pregnant women, it is designated a category C drug.

Side effects are generally uncommon and mild. Pain at injection site, rash, nausea and mild flu-like symptoms have been reported. It should be kept in mind that the site of injection is the key for determining the potential for serious side effects. Injection in the foot has few serious side effects, whereas injection in the head or neck could potentially interfere with vision or swallowing.

Overall, treatment with botulinum toxin is very safe. Injecting the toxin does not cause botulism. The usual therapeutic dosage of BTX-A is in the range of 20–300 U. For an average-sized adult, it is estimated that a lethal dose would have to be at least 3000 U.

Botulinum Toxin Treatment of Vulvodynia

It is widely accepted that vulvodynia is not a single entity. Vulvodynia is classified as either localized or generalized and by whether it is provoked, unprovoked or both. It is often a component of chronic pelvic pain and has been associated with other chronic pain syndromes such as endometriosis, interstitial cystitis/painful bladder syndrome, irritable bowel syndrome, migraine headaches and fibromyalgia. The most common complaint associated with the pain of vulvodynia is dyspareunia or inability to have intercourse. Common physical findings are pain in the vestibular area and hypertonic tenderness of the levator ani muscles, especially the puborectalis and pubococcygeus. These

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physical findings, plus vulvodynia's association with other pain syndromes, are consistent with neuropathic pain and the "cross-talk" of pelvic viscera (internal organs) and pelvic musculature that share a common innervation (nerve distribution). What initiated the pain is usually unknown and probably varies considerably from patient to patient, but once established, the pain becomes self-sustaining.

As a clinician interested in vulvodynia, I see patients who have tried everything and are often referred to me for surgery. I have had considerable success with vestibulectomy in select patients, but I always felt there had to be a less invasive option. In 2001, I contacted Allergan about the potential use of BTX-A for vulvodynia. It so happened that Dr. Dennis Dykstra, an expert in botulinum toxin therapy who had authored several papers on the subject, was chairman of the department of physical medicine and rehabilitation at the University of Minnesota. I knew about its use in relaxing spastic muscles, but I was intrigued to learn about its peripheral antinociceptive effect. Together we started to treat patients with provoked vestibulodynia and published our early results in the June 2006 *Journal of Reproductive Medicine*. We observed a significant improvement in vestibulodynia patients' numeric pain scale rating and their ability to resume intercourse.

Even though our study design is open to criticism as a small case series, the sample size is similar to those in other reports of treating vaginismus and chronic pelvic pain. Abbott (2006) reported the only randomized controlled trial of BTX-A vs. saline in the treatment of patients with chronic pelvic pain and levator ani spasm. In the BTX-A group, there was a significant change from baseline for dyspareunia, nonmenstrual pain and pelvic floor muscle pressure. In the placebo group, only dyspareunia was significantly reduced. An interesting aspect of reports on BTX-A usage in vestibulodynia and vaginismus patients is that, even though there is variation in the dosage, site of injections and frequency of treatment, the end results are similar, i.e., there is a significant reduction in pain and patients are able to resume sexual intercourse. It is also reassuring that there is a lack of significant side effects to treatment.

Mahajan (2007) recently reviewed the use of botulinum toxin in treating lower urinary tract disorders. She reviewed 35 studies, including randomized controlled trials, which demonstrated the efficacy of botulinum toxin in treating neurogenic and idiopathic detrusor (bladder wall muscle) overactivity. Many of these patients were unresponsive to other therapies but had success with botulinum toxin.

Why Botulinum Toxin Works

The vulva and pelvic floor are essentially an integrated network of muscles. Many of these muscles have shared, or overlapping, insertions and origins. The vestibule is the classic location for vulvodynia. Anatomically the vestibule sits atop the perineal body which is the attachment site for the superficial and deep transverse perineal and bulbocavernosus muscles, and the ventral extension of the external anal sphincter. Muscle fibers from the puborectalis, pubococcygeus and sphincter urethrovaginalis muscle also interdigitate, or lock together, on the perineum. Even though many of these are small muscles, tension in any of these muscles can set the stage for the spread of neuropathic pain and tension to other muscles that share the same innervation from branches of the pudendal nerve. Excessive muscle tension pulling on the perineal body from all directions may result in reduced blood flow, ischemia (lack of oxygen) and prolonged pressure on nociceptive receptors in the perineal area. This may eventually lead to sensory changes in the susceptible mucosa and classic hyperalgesia or allodynia, i.e., hypersensitivity of the vestibular area. Based on this scenario, BTX-A should be effective because it reduces the excessive muscle tone and blocks the release of noxious neurotransmitters. Once the hypertonicity and pain are reduced, the patient can start pelvic floor exercises or biofeedback to rehabilitate the muscles as they return to normal strength in the next three to six months.

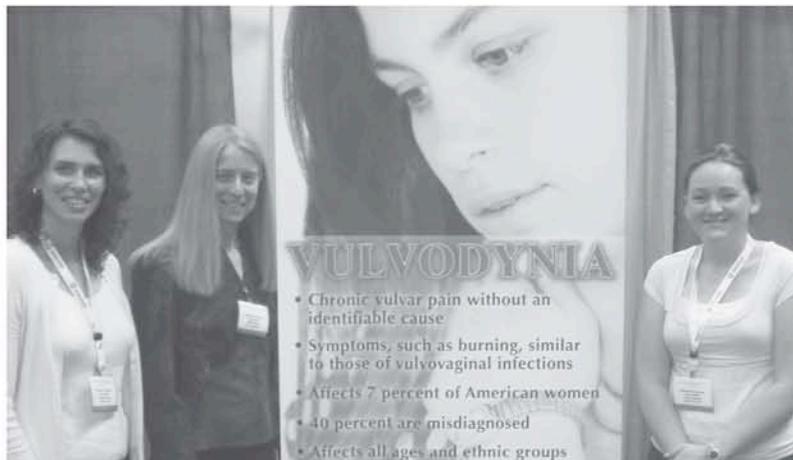
Injection Technique

Injecting BTX-A is relatively simple. Dr. Dykstra has access to a limited supply of BTX-A for use in investigational studies and he is present during the treatments. Patients are not charged for the BTX-

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NVA Exhibits at National Nurse Practitioner Meeting

NVA's director of research and professional programs, Christin Veasley, traveled to Indianapolis in June to staff our first exhibit booth at the American Academy of Nurse Practitioners' (AANP's) 22nd annual meeting. The AANP is the largest professional organization for nurse practitioners in all specialties, with 95,000 members across the U.S. This year's meeting was attended by over 4,000 practitioners, an all-time record, as well as hundreds of corporate and nonprofit exhibitors.



From left to right: Christin Veasley, Kate Chopin and Laurie Legocki with NVA's new exhibit banner.

Local volunteers Kate Chopin, Laurie Legocki, Nicole Piazza and Erica Hungerford set aside time out of their busy schedules to help out at the booth. (Thank you, ladies!) They answered questions about vulvodynia and disseminated complimentary educational materials for both health care providers and vulvodynia patients to the hundreds of nurse practitioners who visited our booth to learn more about vulvodynia.

In early 2007, NVA also staffed an exhibit booth at the American Pain Society's 26th annual scientific meeting in Washington, D.C. More than 2,000 health care professionals and researchers specializing in the treatment of chronic pain attended the meeting. Chris Veasley and NVA administrative assistant, Gigi Brecheen, coordinated this effort

with the help of two local volunteers, northern Virginia support leader Kathy Harrison and executive board member Kathy Polletto.

Exhibiting and organizing presentations on vulvodynia at national women's health and chronic pain medical conferences are an ongoing part of NVA's effort to raise awareness of vulvodynia in the medical community. It's an opportunity to encourage health care providers to learn how to diagnose and treat vulvodynia, and inform them about NVA's many services. ■

Associate Executive Director

The NVA Executive Board is proud to announce that our director of research and professional programs, Christin Veasley, has been named associate executive director. She will remain in charge of research and medical projects, but will also take on other executive decision-making responsibilities. NVA executive director Phyllis Mate describes her experience working with Christin, "Nine years ago, when we hired Chris in her mid-twenties, she proved herself quickly and focused on enhancing patient services and developing programs for the medical community. In recent years, Chris has played a key role in developing and implementing our Congressional awareness campaign, as well as other major initiatives, and it is my pleasure to name her associate executive director." (See photo of Christin above.) ■



Left to right: Erica Hungerford, Christin Veasley and Nicole Piazza at the AANP meeting in June.

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A and they have given consent regarding the treatment. In the past six years, we have injected over 100 patients for vulvodynia, pelvic floor myalgia, detrusor instability, interstitial cystitis/painful bladder syndrome and dysmenorrhea. All but one of these patients have been treated in the office without local or general anesthesia. (One patient did require conscious sedation which was administered by a nurse anesthetist.) There is obviously some discomfort from being examined and experiencing a needle stick, but the treatment is completed in one to two minutes. For vestibulodynia patients, we use a 30 gauge needle with a tuberculin syringe and inject 3 or 4 locations with 0.3 -0.5 ml / site using a total of 50-100 U of BTX-A. I try to infiltrate the perineal body and the site of insertion of the bulbocavernosus and transverse perineal muscles. When injecting the pelvic floor, I gently palpate the levator ani muscles with a finger in the vagina to find the areas of greatest tenderness. It is usually very apparent because the muscles form tight cords where the tension is located. The puborectalis is typically involved and the pubococcygeus or iliococcygeus are the next most common muscles affected. The left side of the pelvic floor is more often involved than the right. I don't know if this has to do with the rectum being in the left pelvis, but many of these patients have constipation associated with their pain. I use a paracervical trumpet to guide the needle to where I will inject. We have generally been using 100 -200 U of BTX - A reconstituted with 5 ml of preservative free saline. I inject two sites per side with equal amounts, or if the pain is unilateral, only the side that is painful. Patients are observed for a short time and leave the office within ten minutes.

Future Investigational Uses for Botulinum Toxin

A perplexing and frustrating problem for patients and physicians is the vaginal fissure. Almost always located in the posterior fourchette, this painful tear in mucosa seems to resist all attempts at permanent healing. The vaginal fissure would seem to be analogous to the anal fissure which occurs in the mucosa between the dentate line and the mucocutaneous border of the anal canal. Because 90 percent of anal fissures occur in the posterior midline and the remainder in the anterior midline, it is thought that excessive tension in the anal sphincter causes thinning of the anoderm (lining of

the anal canal) at the midline. Some experts postulate that hypertonicity of the anal canal, ischemia and infection may all play a role in causing anal fissures. BTX-A has been used to reduce the tone of the anal sphincter and has resulted in healing rates of 78 to 90 percent. I am not aware of any published study on the use of botulinum toxin for vaginal fissures, but it might have similar efficacy.

Botulinum toxin is currently being investigated in the treatment of severe dysmenorrhea in women who are not attempting to get pregnant. Dermatologic conditions, including eczema, have been treated successfully with BTX-A and it may also have a role to play in treating autoimmune disorders of the vulvar skin. Since BTX-A inhibits glandular secretion, it may also be useful in the treatment of hidradenitis suppurativa (a chronic infection of sweat glands around the vulva or in the armpit area) or leucorrhea (abnormally excessive vaginal discharge).

Botulinum Toxin Unknowns

(i) How well will it perform in well designed, randomized controlled trials? (ii) What are the most effective dosages, dilution and number of injection sites to optimize treatment? (iii) Should it be a first-line treatment for vulvodynia and pelvic floor pain or a treatment of last resort? (iv) Is it possible to deliver the botulinum toxin as a topical transvaginal? (v) In the future, can botulinum toxin be further refined and synthesized to have an even more targeted effect? (vi) Will insurance ever cover the cost of the therapy?

Conclusion

Botulinum toxin is a triumph of science. What once was a deadly poison to be feared is now being harnessed as a powerful therapeutic agent with unlimited potential. The use of botulinum toxin in almost all medical specialties has expanded our knowledge of what it is capable of treating. It has been proven to be a safe and effective treatment that can be individualized to patients' needs. In general, vulvodynia and pelvic floor pain disorders have been difficult to understand and treat effectively. Botulinum toxin may hold the key or be a part of the puzzle that eventually shows us how we

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vaginal delivery or a Caesarean birth, also known as a C-section. "Should I have a C-section?" is typically the first question a pregnant woman with vulvodynia asks her doctor. In most cases, surprisingly, the answer is, "Having vulvodynia is not, in itself, a reason to choose a Cesarean section." Many women assume that vulvodynia sufferers should do everything possible to avoid trauma to the vulvar area, but a vaginal birth does not automatically lead to exacerbation of symptoms, or if a woman is pain-free, to the return of symptoms. There is no research outcome data on women with vulvodynia who have had vaginal births, but some experts say it is unusual for a permanent increase in vulvar pain to occur. It is even possible that having a vaginal birth may decrease future pain with sex, because the stretching of the introital skin during delivery can help reduce the discomfort of superficial friction when sexual intercourse is resumed.

Cesarean Birth

A C-section is major surgery in which the newborn is delivered through an incision in the mother's abdomen. Compared to other major surgeries, C-sections are very safe, but there are also potential risks, including an increased risk of infection in the uterus, pelvic organs or abdominal incision; blood loss; blood clots; and injury to the bowel or bladder. Women who deliver by C-section face a longer hospitalization period and recovery time, while simultaneously dealing with the universal challenges of the postpartum period. In addition, dryness and atrophy of the vagina due to estrogen suppression during breastfeeding is more likely to be problematic for women who deliver by C-section. A vaginal delivery leads to stretching of the vaginal walls, which helps to counterbalance the typical tightening of the vagina that occurs during breastfeeding. This tightening may make tender, fragile vaginal tissue even more uncomfortable and add to the discomfort already experienced by women with vulvodynia.

On the other hand, when C-sections are required, they can save lives. Situations in which a Cesarean section may be necessary include, but are not limited to, a breech presentation (buttocks-or feet-down), placental abruption (the placenta tears away from the wall of the uterus), or a pinched or

compressed umbilical cord. In these cases, the benefits of Cesarean delivery far outweigh the potential risks, compared to a vaginal delivery. Note that none of these precipitating causes have any relationship to vulvodynia.

During a C-section, the surgeon makes a horizontal incision in the abdomen and uterus, usually just above the pubic hairline. The newborn is then lifted out through this incision. Prior to the actual surgery, there are a number of steps taken to ensure the safety of the procedure. After the pubic hair is shaved, the abdomen is cleaned with an antiseptic solution, and a catheter is inserted to empty the bladder. Next, an I.V. is inserted into the arm or hand to administer any necessary fluids and medication throughout the procedure. The doctor uses either general anesthesia or a local anesthetic which numbs the lower half of the body, allowing a woman to remain alert throughout the C-section. Surgical drapes arranged just above the incision site block a woman's view of the procedure. If a partner or other family member/friend wants to be present during the delivery, he/she will be suited up in a sterile medical gown and may watch the surgery.

Most of the topics discussed below are pertinent to women who intend to have a vaginal delivery, but it should be noted that some women plan a vaginal birth and eventually need a C-section at some point during labor.

Medicated vs. Unmedicated Labor

The first major issue facing a woman who intends to have a vaginal delivery is whether to rely on anesthesia or proceed with unmedicated labor. The decision whether or not to use anesthesia should be the choice of the pregnant woman, since no one knows her tolerance for pain better than she does. Before a decision is made, she should educate herself about the pros and cons of each option and how those factors might affect her. It is perfectly normal for a woman to be anxious about the pain of childbirth and it is highly recommended that options be discussed with the doctor. Once a decision is made, however, the matter should not be considered completely closed. During pregnancy,

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labor and delivery, it is best to keep an open mind about pain medication as well as other procedures. There is no way to anticipate how difficult or how long a woman's labor will be, or how fatigued she will become.

For women with vulvodynia, there are two schools of thought on pain relief during both labor and delivery. The first approach is to ensure that she be as "numb" as possible in the vulvar area to avoid any additional discomfort during labor and delivery. If a woman can't tolerate vaginal exams because of pain, she will likely want to eliminate the pain of exams during labor. One way to accomplish this is to use a regional anesthetic, such as an epidural. The other option is to reduce the number of, or entirely eliminate, vaginal exams.

The alternative viewpoint is that anesthesia can stall labor, and when labor progresses too slowly, it's more likely that the doctor will need to intervene with forceps or vacuum extraction. These interventions may cause trauma to the perineum (muscle and tissue between the vagina and rectum). There is also concern that an epidural or other type of regional anesthesia will make the muscles beneath the perineum flaccid or limp, increasing the chance that an episiotomy may be necessary. (See *Intact Delivery and Perineal Trauma* below.)

Some women, particularly those struggling with vulvar pain on a constant basis, may simply not want to experience any more pain or discomfort than is absolutely necessary. For these women, an epidural or other pain relief during labor and delivery is generally the best choice.

Labor and Childbirth

Shortly after a woman in labor arrives at the hospital or birthing center, the doctor or nurse will want to perform a vaginal exam to determine how much the cervix has dilated, as well as the presentation and position of the baby. This exam will be repeated just before the pushing phase of labor. Some proponents of intervention-free childbirth assert that these exams are unnecessary and may even increase the risk of infection. Women with vulvodynia who cannot tolerate pelvic exams should

talk to their doctor about the possibility of reducing or eliminating the exams during labor and delivery. If they cannot be eliminated, a regional anesthetic can be given during labor to lessen discomfort.

Once the cervix has completely dilated, it's time to push. The first few urges to push may take a woman by surprise, prompting her to tense her pelvic floor muscles, which is likely to cause pain. It is best to keep the pelvic floor muscles relaxed as the urge to push begins. At this point, light breathing or panting, and relaxing the perineum are helpful.

Slowing the process of pushing the baby out gives the perineum more time to stretch, decreasing the chance of perineal trauma or laceration. Prolonged forceful pushing should be reserved for times when the baby is in distress and interventions are being considered. Some women, including those not suffering from vulvodynia, experience a tingling, stretching, burning or stinging sensation at the vaginal opening as the baby's head crowns. Some women refer to it as a "ring of fire." The pain can be very intense and result in an overwhelming urge to push the baby out quickly, but it is still best to ease the baby out gently, if at all possible. Pushing slowly through contractions when the newborn's head crowns makes it less likely that an episiotomy will be necessary. Some birth attendants massage the perineum at this stage to assist gradual stretching, or maintain steady pressure on the newborn's head to keep him/her from coming out too rapidly. Some doctors will perform an episiotomy at this point. The pressure of the baby's head naturally numbs the perineum because it restricts blood flow to the area and this will decrease or stop the burning. Lying on one's side or remaining upright is preferable because it will decrease pressure on the perineum and allow for maximum stretching.

Fetal Monitoring

Fetal monitors assess the health status of the fetus during labor by measuring the response of its heartbeat to the mother's contractions. Women

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delivering babies in a hospital may be monitored at regular intervals, e.g., once an hour for 15 minutes. Most often it is done using an external fetal monitor, which is a wide belt with two instruments attached; an ultrasound transducer measures the fetal heartbeat and a pressure-sensitive gauge measures the intensity and duration of contractions. These instruments are connected to a monitor that delivers a printout reading.

If there is a reason to suspect fetal distress, the doctor may connect the mother to an internal monitor, which requires attaching an electrode to the baby's scalp to measure its heartbeat. Because there are some slight risks, such as infection, or rash or abscess on the baby's head, internal monitoring is used infrequently, only when the benefits outweigh the risks. The use of an internal monitor requires access to the uterus via the vagina and cervix and the procedure may be uncomfortable, or even painful, for a woman with vulvodynia who has not received an epidural or other regional anesthetic.

Intact Delivery and Perineal Trauma

Whether an episiotomy or laceration will occur during delivery is a common source of anxiety for women with vulvodynia as they approach their due date. Pregnant women should feel free to talk to their health care providers about this issue. There are three possible scenarios involving the perineum during a vaginal birth: intact perineum, spontaneous tearing and episiotomy. Tearing is described in terms of degrees: a tear of the superficial tissues without injury to the surrounding muscle (1st degree) a rupture of the perineal skin (2nd degree), vaginal and rectal mucosa (3rd degree) and anal sphincter (4th degree). Episiotomy is a surgical incision of the perineum performed to enlarge the vaginal outlet as the newborn is crowning. It also is described in terms of degrees: the incision can be through the skin layer only (1st degree), skin and muscle (2nd degree), skin, muscle and rectal sphincter (3rd degree) or involve the skin, muscle, rectal sphincter and anal wall (4th degree). Second-degree episiotomy is the most common episiotomy and 4th degree is the least common. In addition, there are two primary types of episiotomies: median and mediolateral. Most doctors prefer the

mediolateral, which slants away from the rectum. A median incision is made in a straight line toward the rectum, but is used less frequently because it poses a greater risk of extending completely to the rectum.

Clearly the ideal scenario, for women with or without vulvodynia, is to leave the delivery room with an intact perineum. There is no research data specifically for women with vulvodynia, but studies of women in general have shown that postpartum pain is lowest among those who give birth with an intact perineum. Unfortunately, intact delivery with vaginal birth is not always possible.

As mentioned above, during the pushing phase of labor, the doctor will either attempt to stretch the perineum using perineal massage or perform a routine episiotomy (as opposed to a selective episiotomy). Women usually describe the sensation of being stretched as "uncomfortable" rather than painful. Perineal massage does not, however, guarantee intact delivery. It can take 15 minutes or more of massaging before the tissues will stretch and often the perineum doesn't stretch enough before the baby is born. Sometimes, even though it appears as if the tissues have stretched enough, an unpredictable position of the fetus, such as an elbow sticking out, can cause a spontaneous tear. Studies have found that approximately 50 percent of women who do not have an episiotomy will spontaneously tear and 50 percent will not.

Previously, it was standard practice for doctors to perform a routine episiotomy, because they thought it reduced the risk of significant tearing, pain, urinary and fecal incontinence, and pelvic floor defects. In 2005, however, a review of the medical literature found that the benefits traditionally attributed to episiotomy were non-existent and that the procedure actually increased the risk of severe tearing, pain with intercourse, incontinence and other pelvic problems after delivery. Research also has shown that when episiotomies are performed, the incisions are almost always larger than the tearing incurred without an episiotomy. Today, many doctors do not perform routine episiotomies,

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but they may still choose to do a selective episiotomy if the monitor indicates fetal distress. In these situations, time is of the essence and a selective episiotomy can hasten the birth.

There is no research data on how episiotomies or tearing specifically affect women with vulvodynia. While some doctors think that any new scar can be a focus of tenderness, others contend that there is no reason to think that either an episiotomy or spontaneous tear will increase vulvar pain after childbirth. Women should talk to their doctor before labor about the likelihood of having an intact delivery and can express a preference for massage over episiotomy, assuming time allows.

Forceps and Vacuum Extraction

Forceps or vacuum extraction is used in about 10 percent of vaginal deliveries. These interventions are used to speed up delivery when the baby is in distress, or to turn the baby when its position makes delivery more difficult. These procedures also may be used when either pushing has not lead to progress in the baby's descent, or a long period of pushing has left the mother exhausted.

To perform a forceps extraction, two spoonlike instruments are inserted into the vagina and applied to each side of the baby's head. The doctor turns and/or pulls on the handles to help the baby out of the birth canal. This procedure requires that an episiotomy be performed first and that regional anesthesia be administered. The risk involved is that forceps delivery can tear the vagina or cervix. Research has found that delivery with forceps is associated with a 10-fold increased risk of perineal injury compared to deliveries without the use of instruments. If the baby is in distress and a forceps delivery is being considered, vacuum extraction can be requested instead, but the final decision whether to use forceps or vacuum extraction rests with the doctor, who is ultimately the best judge of which procedure is safest.

In a vacuum extraction, a caplike device is applied to the head of the baby and a rubber tube extends from the cap to a vacuum pump that creates suction on the head. This procedure may require an episiotomy. Although vacuum extraction also can

tear the vagina or cervix, it is less likely to do so than forceps extraction.

The First Few Hours After Childbirth

After the newborn arrives, the new mom must pass the placenta, which usually takes between 10 and 30 minutes. Massaging the uterus and/or nursing the newborn at this time can sometimes help speed up the process. Once the birth is complete, the pelvic area is cleaned by pouring water over it and the doctor checks to see if there are any tears that need to be repaired. If stitches are needed and the delivery was unmedicated, a local anesthetic can be given to numb the pain.

Once any repairs are complete, a nurse leads the mother to the bathroom, measuring cup in hand, and instructs her to urinate. If urination does not occur, the nurse may want to insert a urinary catheter. Women with vulvodynia may find the catheter extremely uncomfortable if they have not received a regional anesthetic or the effect of the medication has worn off. It might be possible to avoid the catheter by explaining vulvodynia to the nurse, claiming dehydration and then drinking lots of water (and turning on the tap water) to encourage urination. The nurse will provide a peri bottle (a plastic, squeezable bottle of water with holes in the top), which is used to wash, rather than wipe the vulva after urinating. A stool softener, such as Colace, can be requested to ease bowel movements, which helps reduce straining the already tender perineum.

After urinating, the mother returns to her bed and the nurse provides the first of many disposable ice packs. These cooling packs are applied to the perineum and vulva, on and off, for two to three days. After this initial period, a regimen of warm sitz baths begins. The hospital may provide a sitz bath that fits over a toilet seat or one can be purchased at a medical supply store; alternately, a clean bathtub filled with lukewarm water works fine. Sitz baths can be continued as long as they're helpful. The nurse also may provide a numbing spray, such as Americaine (available at drugstores), which helps numb the perineum if there are stitches.

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Childbirth

(from page 10)

After vaginal delivery, some swelling, soreness and/or bruising in the vulvar area is common. The nurse will offer Tylenol, Motrin or a mild narcotic to ease this pain. Most hospitals use self-administered medication programs that allow the new mom to control her intake of medication. Finally, even women who didn't suffer from hemorrhoids prior to or during pregnancy, may develop hemorrhoids as a result of pushing out the newborn. These varicose veins in the rectum can be painful and some women compare the burning and itching of hemorrhoids with the pain of vulvodynia. Using Tuck's medicated pads (which can be stored in the freezer if desired), along with a prescription cream or over-the-counter ointment such as Anusol, should help heal them quickly.

The new mom should expect to feel very tired after childbirth. Once she's had the opportunity to start breast-or-bottle feeding her newborn, she should try to get some rest. The newborn will fall asleep after a few hours and it's a good idea for the mom to sleep at the same time. As she begins this new phase in her life, the body begins its healing process and eventually returns to its pre-pregnant state. She should continue to eat healthy foods, drink plenty of water and rest as often as possible—it won't be very long before she has to keep up with her increasingly mobile infant! ■

Botox

(from page 6)

can best serve our patients. Time will tell what role botulinum toxin will play in the treatment of female pelvic pain and vulvodynia. Hopefully, it will be another victory for physicians and their patients.

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