Severe Complications of a "Brazilian" Bikini Wax

Claire Dendle,[1] Sheila Mulvey,[3,5] Felicity Pyrlis,[2] M. Lindsay Grayson,[1,4,6] and Paul D. R. Johnson[1,4]

[1]Infectious Diseases Department and [2]Endocrinology Department, Austin Health, and Departments of [3]Obstetrics and Gynaecology and [4]Medicine, University of Melbourne, Melbourne, [5]Mercy Hospital for Women, Heidelberg, and [6]Department of Epidemiology and Preventive Medicine, Monash University, Clayton, Victoria, Australia

A 20-year-old Australian woman with poorly controlled type 1 diabetes presented with life-threatening *Streptococcus pyogenes* and *Herpes simplex* infection of her external genitalia following a routine perineal "Brazilian" bikini wax. Extensive pubic hair removal is now common among young adults in Australia and elsewhere. However, the infectious risks of these practices, particularly among immunosuppressed individuals, are often underappreciated.

A 20-year-old Australian woman presented to our emergency department (Austin Health; Melbourne, Australia) with high fever and swelling of the external genitalia. She had poorly controlled type 1 diabetes mellitus as a result of nonadherence with insulin therapy, had a history of frequent episodes of diabetic ketoacidosis, and had a glycosylated hemoglobin level of 11.9%.

Two weeks before presentation, the patient had undergone a "Brazilian" bikini wax at a beauty salon that involved removal of all hair from her mons pubis, vulva, and anus with hot wax. The patient experienced significant pain and some vulval bleeding during the procedure, which was performed by a trainee beauty therapist.

During the subsequent 4 days, worsening vulval swelling, redness, and pain were noted, as well as a copious vaginal discharge. On the day of presentation, the patient reported excruciating perivulval pain, severe dysuria, fever, and a diffuse erythematous rash.

The patient's last normal menstrual period finished 4 days before presentation, and there was no history of tampon use or of a foreign body in the vagina. She had 1 male sexual partner with whom she had been having unprotected sex for several months. There was no history of previous infective episodes or vaginal trauma.

At presentation, the patient was found to be febrile (temperature, 38°C), hypotensive (blood pressure, 90/60 mm Hg), and tachycardic (heart rate, 100 beats/min), and she looked very unwell. There was an erythematous rash over the patient's chest and neck. The external genitalia were grossly swollen—particularly the vulva, the labia majora and minora, and the clitoris—with the urethra displaced inferiorly and cellulitis extending from around the vulva up onto the abdominal wall. The distribution of the cellulitis was consistent with the area onto which the wax had been applied. There was a copious, purulent vaginal discharge and prominent white exudate on the vulva. Examination was difficult because of the extreme swelling, but no vesicular lesions or ulcers were seen. Neither speculum nor bimanual vaginal examination was able to be performed because of severe pain. The findings of the rest of the physical examination were unremarkable.

Laboratory investigations revealed normal findings of a complete blood examination, as follows: hemoglobin level, 126 g/L (normal range, 115–165 g/L); WBC count, 8.7×10^9 cells/L (normal range, $4.0–11.0 \times 10^9$ cells/L); platelet count, 257×10^9 platelets/L (normal range, $150–400 \times 10^9$ platelets/L); albumin level, 21 g/L (normal range, 36–48 g/L); bilirubin level, 11 mmol/L (normal value, <18 mmol/L); alanine transaminase level, 428 U/L (normal value, <34 U/L); alkaline phosphatase level, 182 U/L (normal range, 32–91 U/L); and γ-glutamyl-transferase level, 246 U/L (normal value, <38 U/L). The patient's glucose level was 20.9 mmol/L with no ketoacidosis, but her blood urea nitrogen level and electrolyte levels were within the normal range. The patient's coagulation profile was normal. Serological test results were negative for hepatitis A, B, and C and for HIV infection; subsequent urinary PCR test results were negative for *Chlamydia trachomatis*.

Gram stain of vaginal discharge samples demonstrated profuse polymorphs, profuse gram-positive cocci, scanty gram-positive bacilli, and scanty gram-negative bacilli; culture grew a pure growth of *Streptococcus pyogenes*. Culture of a midstream urine sample demonstrated $>500 \times 10^6$ leukocytes/L and grew *S. pyogenes*. No organisms were isolated from 3 sets of blood cultures. Herpes simplex virus multiplex PCR of vaginal fluid samples had results positive for herpes simplex virus type 1.

The initial differential diagnosis was severe perineal strep-

tococcal cellulitis with probable toxic shock, because the patient's case fulfilled 1 major (hypotension) and 2 minor criteria (rash and hepatitis) for this diagnosis and because *S. pyogenes* was isolated from a nonsterile site. Other differential diagnoses included necrotizing fasciitis, infection with community-acquired methicillin-resistant *Staphylococcus aureus,* and invasive fungal infection. CT with intravenous contrast of the abdomen and pelvis demonstrated bilateral lymphadenopathy and stranding of subcutaneous fat but no gas, fluid collections, or abnormalities in the fascia or muscle.

The patient underwent a careful gynecological examination under general anesthetic, at which time, gross edema, excoriation, and exudate were noted, suggestive macroscopically of severe candidiasis but no collections. Intraoperative vulval biopsy demonstrated extensive epidermal ulceration associated with viral inclusion bodies.

The results of immunoperoxidase staining were positive for herpes simplex virus type 1 and demonstrated typical multinucleated cells. The PCR results were positive for herpes simplex virus type 1.

The patient initiated therapy with our necrotizing fasciitis protocol, including meropenem, clindamycin, ciprofloxacin, vancomycin, and intravenous immunoglobulin. Because of the intraoperative and histological findings, amphotericin B and acyclovir were added to the treatment regimen.

The patient developed prominent hepatitis, with a peak alanine transaminase level of 928 U/L (normal value, <34 U/L), but she gradually improved, becoming afebrile after 5 days of therapy. She was discharged from the hospital on day 10 of therapy and was able to return to work after 21 days.

Six months later, the patient again attempted to remove her pubic hair by shaving herself; however, she had difficulty visualizing the area. She subsequently developed a recurrence of herpes and cellulitis of her vulva. She was readmitted to the hospital and was treated with valaciclovir and penicillin, and her condition improved.

A clinical examination in the outpatient clinic after her second hospital admission demonstrated labial syncytia and adhesions but showed full resolution of inflammation without skin loss. Despite her traumatic experiences, the patient was keen to undertake further removal of pubic hair.

The desire to be beautiful is as old as civilization itself, and beauticians are an integral part of many communities, often playing the role of a trusted therapist. However, as demonstrated by this case, certain beauty treatments may pose infectious risks in susceptible hosts. This case is notable, because it is the first case, to our knowledge, of group A streptococcal infection with toxic shock and reactivation of herpes following a bikini wax that recurred upon further depilation.

Attitudes towards to the removal of pubic hair have varied over the centuries and with different cultures [1]. However, it was not until the late 20th century that extensive hair removal became more common, largely as a result of the fashion industry. The bikini was introduced in France in 1946, and as a result, the "Brazilian" bikini wax has evolved. Extensive removal of pubic hair is now commonplace among young women and adolescent girls, who often remove their hair before reaching tanner stage 5 [1]. "Brazilian XXX" and "Epile complet" are terms used to describe the removal of all pubic hair, but a "Brazilian wax" more usually involves removal of hair from the mons pubis, the labia majora, and the area around the anus, with the retention of a small strip of hair on the mons pubis. In addition, pubic hair can be styled into various designs and can be dyed.

There are numerous available hair-removal methods, such as shaving, clipping, epilation, depilatory creams, laser hair removal, electrolysis, sugaring, and threading (or "Khite" in Arabic), which is an ancient practice originating in the Middle East and Far East, whereby a cotton thread is grasped with one hand and the teeth and the hair shaft is extracted [2]. Waxing, however, is the most common method for extensive depilation, and complications include burns, mechanical folliculitis, infectious folliculitis, other infections of skin and soft tissues, and contact dermatitis and/or vulvitis [1]. Removal of hair causes skin microtrauma, with inoculation of pathogens and subsequent mechanical spread of infection [3]. A recent systematic review of surgical site infections found that shaving resulted in more infections than clipping, presumably because the skin was not breached with clippers [3]. Infecting organisms can be from autoinoculation of skin or vaginal flora and group A streptococci are known to colonize the vagina [4]. Infecting bacteria can include *S. aureus* and *Pseudomonas aeruginosa,* and other potential pathogens include human papilloma virus, molluscum contagiosum, dermatophytes (such as *Trichophyton tonsurans*) resulting in Majocchi granuloma, and more unusual fungi, such as *Sporothrix schenckii,* which has been reported following electrolysis [5, 6].

Other sources of infection include contaminated products, such as wax, creams, or cloths, fomites spread within the salon environment, and the therapist. There are reports of heath care workers colonized with group A streptococci causing clinical infection with identical strains in patients [4].

Although waxing can predispose to certain bacterial and vulval infections, data from the United Kingdom suggest that "Brazilian" waxing may actually reduce the incidence of pubic lice. From 1997 through 2003, despite a significant increase in cases of gonorrhoea and chlamydia, there was a reduction in the rate of pubic lice. The most dramatic decrease occurred in 2000 and coincided with the introduction and increase in popularity of extensive waxing techniques in Britain [7].

There are few published data regarding infectious risks associated with beauty salons. Data from Italy suggest that beauty

therapy has a significant role in the spread of viral hepatitis [8]. An outbreak of *Mycobacterium fortuitum* infection involving >100 patrons of a single nail salon linked disease transmission to the use of whirlpool footbaths. Since that time, there have been additional outbreaks and sporadic reports, suggesting that the problem may be more widespread than previously thought [9, 10]. A novel mycobacterial species *(Mycobacterium cosmeticum)* has been isolated from salons [11]. Beauty salons can offer a range of innovative therapies, the complications or infectious risks of which are little documented. Facials that involve manual comedone extraction, dermabrasion, or harsh chemical peels pose the risk of infection and are often performed without the use of gloves. There are no uniform standards for infection-control practices in beauty salons in some countries and, although certain health departments publish guidelines regarding infection-control practices, these are variably enforced. Random sampling of nail salons in England demonstrated low rates of hepatitis B immunization among technicians, poor use of gloves, reuse of single-use instruments, and inadequate knowledge of universal infection-control precautions [12].

The number of people with immunosuppression as a result of diabetes, HIV infection, and transplantation has increased substantially, particularly in the past 20 years [13–15]. Diabetes is a clear risk factor for common infections, including bacterial skin and mucous membrane infections [16], and it is an independent risk factor for invasive group A streptococcal disease [17]. This immunocompromised patient population includes a significant number of young people who will engage in beauty therapy, including pubic hair removal, and may be at high risk of infectious complications.

Physicians should warn immunosuppressed patients of the risks of extensive body hair removal (in particular, removal of pubic hair) and suggest that they attend hygienic and reputable establishments. Advice on shaving techniques, ensuring that the wax is not too hot, and testing of products on nongenital areas can be offered. Patients should attend hygienic beauty salons, where therapists regularly wash their hands and wear gloves. Patient support groups, such as the Diabetes Council, should also be aware of and warn patients of the risks.

Our case is notable, because it illustrates the infectious risks of pubic hair removal in a patient with diabetes. The beauty industry is growing at an unprecedented rate [18], and more invasive and potentially harmful procedures are increasingly available. There is a current widespread trend for the extensive removal of pubic hair, and physicians need to be familiar with these beauty practices to advise their patients appropriately, particularly those patients with immunosuppression.

Acknowledgments

References

1. Trager JD. Pubic hair removal—pearls and pitfalls. J Pediatr Adolesc Gynecol **2006**; 19:117–23.
2. Bloom MW, Carter EL. Bullous impetigo of the face after epilation by threading. Arch Dermatol **2005**; 141:1174–5.
3. Tanner J, Woodings D, Moncaster K. Preoperative hair removal to reduce surgical site infection (review). Art no: CD004122.pub2. DOI: 10.1002/14651858.CD004122.pub2. The Cochrane Database of Systematic Reviews **2006**; 2.
4. Kolmos HJ, Svendsen RN, Nielsen SV. The surgical team as a source of postoperative wound infections caused by *Streptococcus pyogenes*. J Hosp Infect **1997**; 35:207–14.
5. Ditmars DM Jr, Maguina P. Neck skin sporotrichosis after electrolysis. Plast Reconstr Surg **1998**; 101:504–6.
6. Elgart ML. Tinea incognito: an update on *Majocchi granuloma*. Dermatol Clin **1996**; 14:51–5.
7. Armstrong NR, Wilson JD. Did the "Brazilian" kill the pubic louse? Sex Transm Infect **2006**; 82:265–6.
8. Mariano A, Mele A, Tosti ME, et al. Role of beauty treatment in the spread of parenterally transmitted hepatitis viruses in Italy. J Med Virol **2004**; 74:216–20.
9. Winthrop KL, Abrams M, Yakrus M, et al. An outbreak of mycobacterial furunculosis associated with footbaths at a nail salon. N Engl J Med **2002**; 346:1366–71.
10. Winthrop KL, Albridge K, South D, et al. The clinical management and outcome of nail salon-acquired *Mycobacterium fortuitum* skin infection. Clin Infect Dis **2004**; 38:38–44.
11. Cooksey RC, de Waard JH, Yakrus MA, et al. *Mycobacterium cosmeticum* sp. nov., a novel rapidly growing species isolated from a cosmetic infection and from a nail salon. Int J Syst Evol Microbiol **2004**; 54:2385–91.
12. Johnson IL, Dwyer JJ, Rusen ID, Shahin R, Yaffe B. Survey of infection control procedures at manicure and pedicure establishments in North York. Can J Public Health **2001**; 92:134–7.
13. World Health Organization. State of the epidemic 2004, the impact of HIV/AIDS. Geneva: Joint United Nations Programme on HIV/AIDS, World Health Organization, **2002**.
14. Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes: estimates for the year 2000 and projections for 2030. Diabetes Care **2004**; 27:1047–53.
15. Williams MC, Creger JH, Belton AM, et al. The organ center of the united network for organ sharing and twenty years of organ sharing in the United States. Transplantation **2004**; 77:641–6.
16. Muller LMAJ, Gorter KJ, Hak E, et al. Increased risk of common infections in patients with type 1 and type 2 diabetes mellitus. Clin Infect Dis **2005**; 41:281–8.
17. Factor SH, Levine OS, Schwartz B, et al. Invasive group A streptococcal disease: risk factors for adults. Emerg Infect Dis **2003**; 9:970–7.
18. Pots of promise. The Economist. 22 May **2003**.