On the Origin of Pedicled Skin Inversion Vaginoplasty

Life and Work of Dr Georges Burou of Casablanca

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Abstract: The first reports on gender-confirming surgery had been published in Germany in the 1920s, but it took some 30 years before sex reassignment surgery for transsexuals became generally known. Initially, such surgery was performed mostly in Europe and Casablanca. In 1956, the gynecologist Dr Georges Burou (1910–1987) independently developed the anteriorly pedicled penile skin flap inversion vaginoplasty in his Clinique du Parc in Casablanca. This technique was to become the gold standard of skin-lined vaginoplasty in transsexuals. During his life, he was to perform well over 800 vaginoplasties for transsexual patients from all over the world, but Burou always kept a low profile to be able to continue this controversial part of his work in Morocco. Because his work was pioneering and innovative, Georges Burou and his vaginoplasty are given a place in the recorded history of plastic surgery.

Key Words: transsexualism, vaginoplasty, medical history

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Although the first reports on gender-confirming surgery had been published in Germany in the 1920s,[1–3] it took some 30 years before sex-reassignment surgery for transsexuals became generally known. The Danish plastic surgeon Paul Fogh-Andersen[4] initiated the modern era of such surgery in 1952, when he used the penile skin as a full-thickness skin graft to line the neovagina of world-famous Christine Jörgenson in Copenhagen. Initially, these surgical procedures were carried out mostly in Europe and Casablanca,[5,6] but in the mid-1960s, centers in the United States also became interested in sex-reassignment surgery. Predominately, this was the result of Harry Benjamin's efforts to find competent surgeons for his patients.[7,8] In 1966, Benjamin[7] reported in his book on the *Transsexual Phenomenon* that he had observed approximately half of the results of the conversion operations that Dr Elmer Belt in California had performed in California. By then, however, Dr Belt had already "discontinued this type of surgery, largely for personal reasons." The first sex-reassignment procedures at Johns Hopkins in Baltimore were performed in 1966,[9] to be followed shortly after by the university hospitals of Stanford and Chicago.[10,11] At Johns Hopkins, partial-thickness skin grafts were initially used to line the neovaginal cavity, but subsequently the penile skin was applied as a full-thickness skin graft, just like in Copenhagen.[12] The *posteriorly* pedicled penile skin flap inversion technique for vaginoplasty in male-to-female transsexuals was introduced by Edgerton and Bull[12] at Johns Hopkins sometime between 1968 and 1970, whereas the Chicago group had been using the *anteriorly* pedicled penile skin flap to line the vagina and the scrotal skin to form the labia, since 1967.[11]

Well before that, Dr Georges Burou (1910–1987) had independently developed and applied this technique in his clinic in Casablanca (Fig. 1).[5–8,13,14] During his life as a gynecologist, Burou always kept a low profile to be able to continue this more controversial part of his work in Morocco. Even though his name was well known in transsexual circles throughout the world,[15] it was hardly heard of among colleagues. Because his work was pioneering and innovative, bringing relief for so many suffering individuals that could turn nowhere else for help in those days, Georges Burou and his vaginoplasty ought to be given a place in our written history.

Burou's Vaginoplasty

Burou considered his work to essentially be a form of plastic surgery,[14] and indeed, most vaginoplasties are currently performed by plastic surgeons. As holds true to date, the entire surgical procedure was done in 1 operation consisting of 2 successive parts: (1) the creation of a space between the rectum and the prostate, and (2) the lining of this space with penile skin after the latter had been separated from its contents. According to Burou,[6] the operation was started by making an incision from the anal area through the scrotal raphe. After dissecting of the bulbus urethrae and both corpora cavernosa, the rectum and the prostate were separated by cutting all the ligaments between the bulb and the rectum. Burou made a point of baring, but not damaging, the posterior aspect of the prostrate. In this way, the penile skin flap after invagination would immediately overlie this aspect, which, as he rightly felt,[16] optimized the possibility of postoperative orgasm. The separation was extended digitally and was considered complete as soon as 2 fingers or a vaginal retractor

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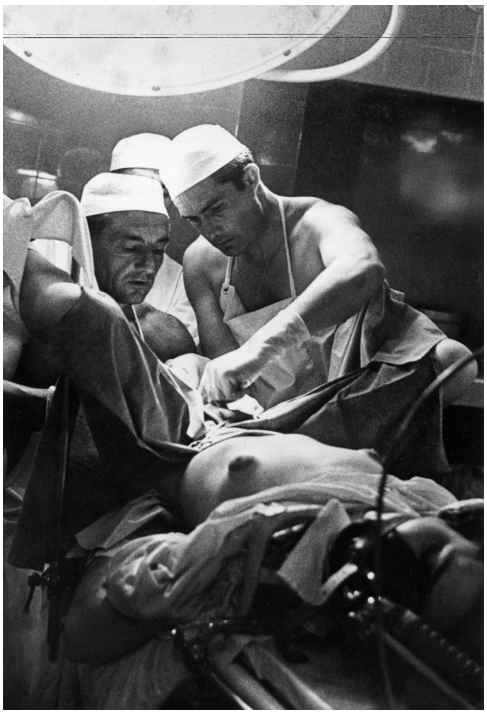

FIGURE 1. Docteur Georges Burou (left) performing a vaginoplasty in a male-to-female transsexual patient. Note that both Burou and his nurse-technician Joachim Cobarro (right) are scarcely clad, adjusting to Casablanca temperatures (reprinted by kind permission from *Paris Match* and Patrick Jarnoux).[14]

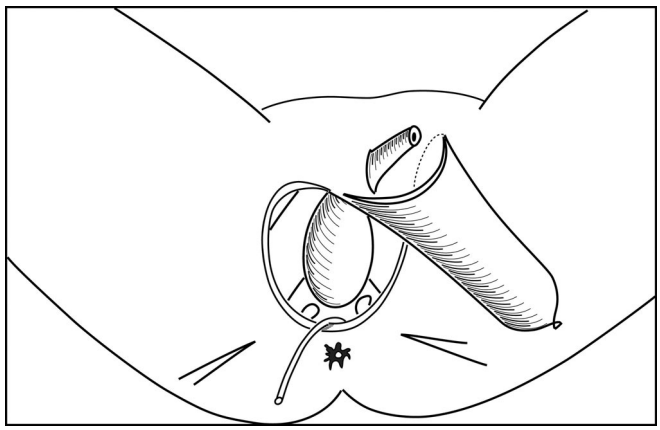

FIGURE 2. After ligation and dissection of both corpora cavernosa and transection of the spongious bulb and urethra, all erectile bodies were being dissected from the penile skin and the distal, coronal edge of the penile skin was closed. This yielded the skin tube that was inserted as neovaginal lining. On the lower abdominal skin, a slight skin slit was made to allow the future urethra to be passed through. Note that there is no skin suture to the urethra but that it will only be sutured on the catheter, about 5 cm from the skin. Two sutures were bilaterally passed through the perianal skin and the levator ani muscles to later support an intravaginal bougie. A drain was left in the posterior commissure (reprinted by kind permission from D. R. Laub and P. Gandy).[6] This figure can also be found along with other original illustrations of Burou's 1973 Stanford presentation on http://ai.eecs.umich.edu/people/conway/TS/Burou/Burou.html (accessed June 16, 2005).

could be admitted easily and the natural vaginal cul-de-sac, Douglas vault, was met. Burou[6] considered this first part of the operation to be the most important, but most risky, part and stressed the importance of repeated intrarectal inspection to determine, throughout this part of the operation, that there is no lesion to the rectal wall.

He considered the second part of the operation to be relatively easy. The initial incision was extended along the raphe of the scrotum to the root of the penis. The surgical field was widened by retracting the scrotal skin on both sides and widely exposing the corpus spongiosum, both corpora cavernosa, and the 2 testes. Once the testes and their pedicles had been dissected, the spermatic cord was cut and ligated. Then, both corpora cavernosa were ligated and cut at a level just distally to their attachment to the inferior ramus of the pubic bone. The level of transection of the spongious bulb and urethra had to correspond with the length of the future female urethra. Subsequently, all erectile bodies were pushed out and dissected from the penile skin. When available, the foreskin was kept and the distal, coronal edge of the penile skin was closed. This yielded the skin tube that was inserted as neovaginal lining (Fig. 2).

On the lower abdominal skin, a slight skin slit was made to allow the future urethra to be passed through upon inversion of the neovaginal lining. A Foley catheter was inserted and the urethra was sutured onto the catheter, about 5 cm distally from its passage through the skin. No skin suture was used in the urethral meatus, and some kind of scar contraction was always foreseen.[6] Two sutures were bilaterally passed through the perianal skin and the levator ani muscles. These 2 sutures served to tightly and firmly support an obstetric stent, placed in the neovagina to provide support for the inverted skin flap. A drain was left in the posterior commissure. Finally, excess scrotal skin was resected to obtain a good appearance of the major labia.

In 1956, Burou's first vaginoplasty had taken him 3 hours to complete, but at the height of his sex-reassignment work by 1974, when he was performing 5 to 6 vaginoplasties a month, each took him no longer than 60 minutes.[14] Postoperatively, the patient's arms were stretched away from the body and strapped to the bed until a nurse released them the following morning.[15,17] The drain was removed 48 hours after surgery, while the catheter was kept in for 2 more days. The vaginal stent was maintained for 8 days after surgery. Thereafter, the new vagina was managed by frequent and daily introduction of fingers or small vaginal retractors. In the next few days, the patency of the urethra had also to be maintained by daily introduction of a catheter, ensuring that no neomeatal stenosis occurred.[6] Most patients spent some 2 weeks in Burou's clinic. Contact with the outside world was not encouraged, and only upon recovery the patients became precariously perambulatory and took to exploring, further to realize that they were not after all alone in the clinic. Later still, when they were sufficiently recovered to go to the doctor's office to have their dressings changed, they were likely to set

eyes for the first time on other transsexuals: "How many there were of us, I do not know, but we were of several varieties. We were Greek, French, American, British."[15]

Burou's Sex-Reassignment Patients and Results

Even though Burou[6] reported all his vaginoplasty patients to have been prepared, to have undergone psychiatric care and hormonal therapy, and to have been quite feminine, his famous patient writer Jan Morris claimed that Burou did not bother too much with diagnosis or previous treatment.[15] Burou confirmed not to ask many questions and to fulfill his patients' wishes[13] but restricted his sex-reassignment surgery to male-to-female transsexuals with a distinct feminine appearance or character.[14] Moreover, he refused to honor requests for such surgery in minors, even in cases where these requests were supported by the parents. He did so "because the operation is definitive and irreversible and one . . . could not risk making a mistake."[14] Apart from these restrictions, Burou saw himself as a technician not to be bothered with legal or moral conditions.[13,15] Often, his international transsexual patients would arrive in the afternoon at the clinic, where they were admitted immediately to undergo surgery the same evening or early the next morning.[15] Working this way, Burou was able to oblige numerous patients and acquire a vast experience. With some 800 cases operated by 1974,[14] he was felt to have the largest series in the world with this type of surgery, and he was acknowledged for his "results that are cosmetically excellent" (Figs. 3 and 4).[10,15,17]

After having performed his first few vaginoplasties in 1956, Burou waited some months to observe and evaluate their outcome. Subsequently, however, the results were not being subjected to routine follow-up study,[10,14] and Morris[15] reported that his "craftsmanship, though esthetically brilliant, was functionally incomplete." Still, Burou felt that "the new women should not expect to get children, but they become women in all other aspects."[14]

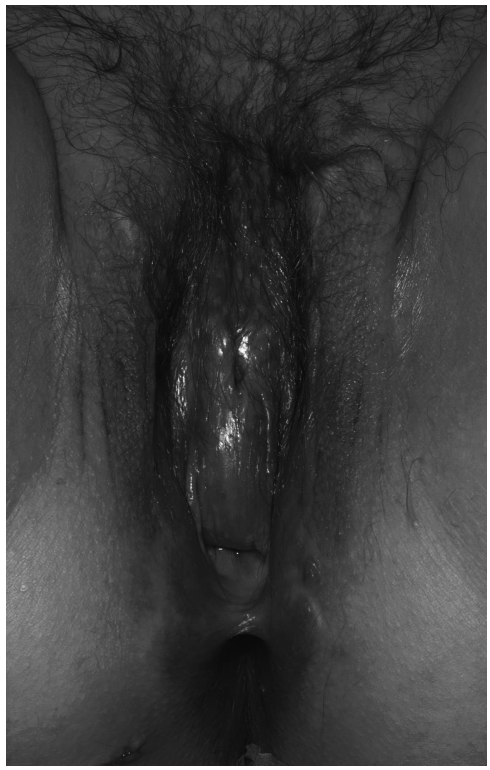

FIGURE 3. Result in a 62-year-old male-to-female transsexual of a vaginoplasty done by Dr Burou in the late 1950s, when she was 21 years of age. Note the median swelling representing the remnants of the spongious corpus and the resulting, outspoken ventral position of the urethral neomeatus. Consequently, we resected the remnants of the corpora cavernosa and spongiosum, performed an urethrotomy and clitoroplasty, and medialized the ventral aspect of both major labia.

Burou's Background and Presentation

Georges Burou was born on September 6, 1910, in Tarbes in the Hautes Pyrénées, France, while his parents were visiting the Burou family in the nearby village of Juillan during their holiday. He grew up in Algiers, the capitol of the then French colony Algeria, where his parents lived and worked as schoolteachers. As he rather wanted to be a commercial marine officer, he reluctantly started his medical training at the Algiers University of Medicine in Algiers, Algeria. Even though he would never lose his love of the sea, he was subsequently known to enthusiastically practice 7 days a week and, more often than not, 12 to 15 hours a day throughout his life. He specialized in gynecology and obstetrics at the Maternity of Mustapha Hospital in Algiers and became Chef de Clinique at Parnet Hospital in the Algiers suburb of Hussein Dey under the supervision of Dr Amedee Laffont-Lacrampe. Laffont had been one of his teachers at medical school and soon after became the Doyen de la Faculte (Dean of the Medical School). Laffont was famous for founding the Encyclopedie Medico-Chirurgicale de France, as well as for introducing in France the currently still practiced Russian breathing technique during delivery. During his training, Georges developed his special interest for anatomy, and his later colleagues were always impressed by his detailed knowledge of the anatomy of the perineum and pelvis. Burou cherished his training with Laffont, and when he opened his office in Casablanca, the plate at his clinic's entrance still stated him to be "Ex-Interne des Hopitaux d'Alger and Ex-Chef de Clinique Obstréticale."[13] He was also to keep a photograph of his trainer in his office throughout his life.

In 1940, Burou followed his wife-to-be Jeanne ("Nanou") Boisvert from Algiers to Casablanca in Morocco, where her parents had a farm. Assisted by Nanou, he started working as gynecologist-obstetrician from his private quarters at the third floor of a classic colonial building at 103 Boulevard de la Gare (after Morocco obtained its independence in 1956, the name of this street was changed to Boulevard Mohammed V). He performed his daily surgery in the Clinique Comte at Parc Murdoch (currently Clinique Mers Sultan at Parc ISESCO).

On the morning of Sunday, November 8, 1942, the US Marine troops landed in Casablanca and Dr Burou was almost killed by a 10-kg piece of shell while taking care of badly burned and otherwise wounded French sailors in the school-

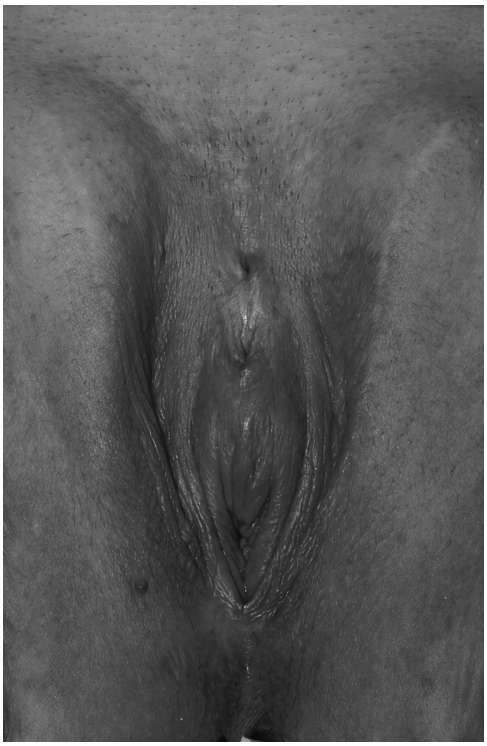

FIGURE 4. Result in a 53-year-old male-to-female transsexual, of a vaginoplasty done by Dr Burou some 27 years before, in the late 1960s. Note the median sagittal swelling representing the remnants of the spongious corpus. The patient was happy with the result and did not request any corrections of her vagina or vulva.

yard of Ecole de la Fonciere at Rue de l'Horloge (currently Rue N′Chakra Rahal). Although the branch of a tree protected Burou from the piece of metal, he would always keep it in his office as a reminder of the finiteness of life. From early 1943 onward, Georges Burou first served as second lieutenant of the Corps Expéditionnaire Français, and he eventually left North Africa as a military surgeon of the 2nd Moroccan Mountain Division to actively join battle at the French island of Corsica and the Italian river Garigliano and mountain of Cassino. Together with New Zealand and Indian troops, his division forced through the German Gustav Line at Cassino on May 13, 1944, the turning point in the liberation of Italy. That day, the 2nd Moroccan Mountain Division lost 1120 men.[18] After the liberation of Rome, Venice, and Sienna, Burou was landed at Cassis, France, for the Allied campaigns in the Provence, the Alps, the Vosges, and the Alsace. During the subsequent liberation of Strasburg in 1945, he lost one of his best friends. Shortly after, when in the south of Germany, he had his first and final break of the war when he returned to Algiers to bury his father.

In 1950, the Burou family moved to live and work at 71 Avenue d'Amade (currently Avenue Hassan II) opposite Casablanca's main park, currently called Parc de la Ligue-Arabe. From 1950 to 1952, Burou and Nanou built the Clinique du Parc at 13 Rue Lapébie (currently Rue Mélouia), a backstreet that ran parallel to the prestigious Avenue. The Clinique is a 5-story building that was attached to the office and family's private quarters at Avenue d'Amade in order "not to distance himself from his patients,"[14] as well as to be immediately available for deliveries at night. The roof of the clinic doubled as the terrace for the private quarters. Consequently, the offices and clinic could be entered via the elegant entrance at the prestigious Avenue (Fig. 5A, B) or via the less conspicuous entrance at Rue Lapébie (Fig. 6A, B). Here, Burou combined his sex-reassignment work with his more ordinary work in obstetrics and gynecology. His outpatient clinics were mostly held in book-lined offices at Avenue d'Amade,[13,15] whereas the Clinique at Rue Lapébie included the operation rooms and a surgical ward. The second floor held a 15-crib nursery, and the third floor held the delivery rooms and patients' rooms. Nanou had named these rooms

FIGURE 5. A, In 1950, Burou moved his gynecologic offices and private quarters to the fifth floor at number 71 of the prestigious Avenue d'Amade in Casablanca (currently Avenue Hassan II). The offices' shades were down when this photograph was made. Immediately behind this building, Burou and his wife Nanou built the Clinique du Parc that opened in 1952. B, Detail of the still-elegant entrance at 71 Avenue Hassan II.

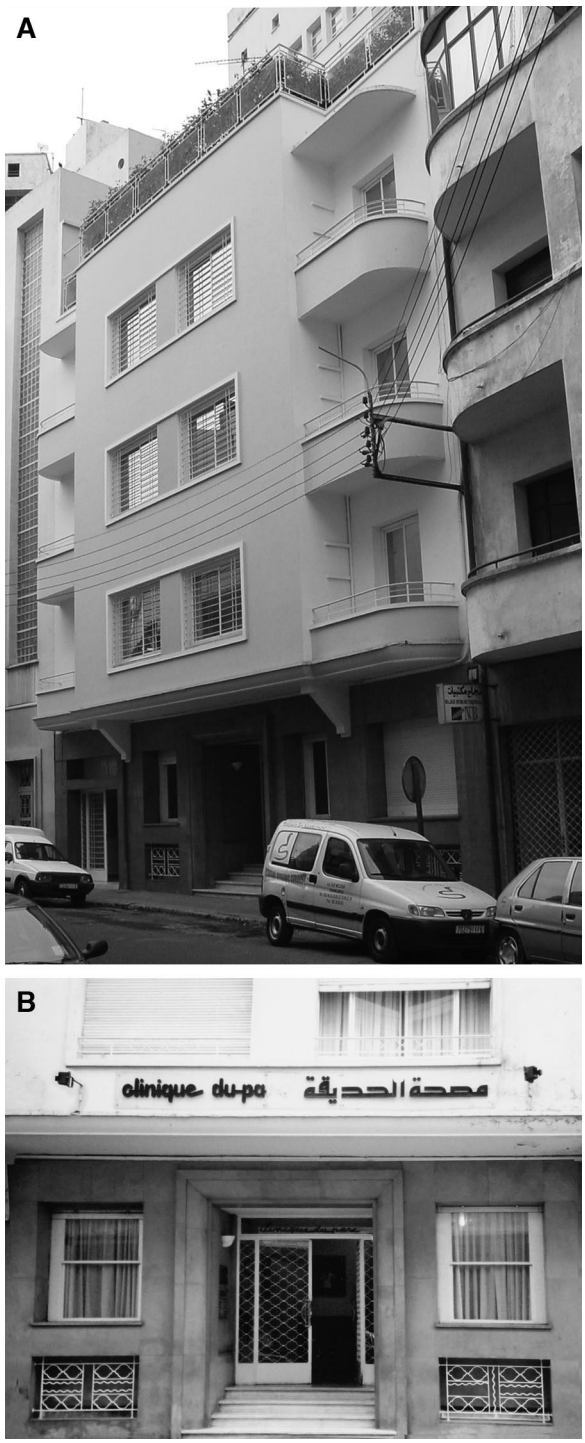

FIGURE 6. A, The less conspicuous entrance of the 5-story Clinique du Parc at 13 Rue Lapébie (currently Rue Mélouia) in Casablanca, where Burou had his operation theater and surgical ward on the second and third floor. The roof of this building formed the terrace of the family's private quarters at 71 Avenue d'Amade. B, Note that part of the name of the clinic still remained over its entrance when this photograph was made in 2002. Meanwhile, the building became the Centre International de Médecine du Travail.

after flowers that were hand-painted in little frames on each door. These floors were always lively, "but an air of stern purpose informed the fourth floor, for these were the operating quarters."[15] This part of the clinic seemed to be plunged into permanent silence. Burou was to work in the Clinique until his death, even after he divorced Nanou in 1970.

Burou was a charismatic man. He was gray-blue eyed but dark with a bronzed skin, rather intense of feature, and always casually but impeccably dressed.[13–15] Throughout his life, he was a devoted sportsman, and he was among the first to cross the Strait of Gibraltar on water skis. He loved all nautical sports and golf and, up until his death, was a fierce windsurfer. His spoken English was restricted to some gynecologic terms and the basics of golf vocabulary. Twice a day, Burou would do his rounds "dressed for the corniche and looking in general pretty devastating."[15] Morris recalled how he would sit at the end of her bed "and chat desultorily of this and that, type a few very slow words on my typewriter, read a headline from *The Times* in a delectable Maurice Chevalier accent, and eventually take an infinitely gentle look at his handiwork."[15] Ever being a courteous gentleman, Dr Burou heartily thanked the "many American physicians who supported him in his work, referring many American patients, and who had been extremely helpful in corresponding with him" during his presentation at the second interdisciplinary symposium on gender dysphoria syndrome in Palo Alto in 1973, his only presentation ever.[6] Still, Burou was not willing to work with the Harry Benjamin International Gender Dysphoria Association, and it was very difficult to professionally get into contact with him.[17]

Burou was gifted with extraordinary intelligence and dexterity, and he thrived on challenges, be they professional or sportive. He was never interested in financial matters and he did not like to discuss them with his patients: "You know my fee? Ah well, perhaps you will discuss it with my receptionist; *bien*, *au revoir,* until this evening!"[15] In 1975, one of our patients addressed Burou, asking him for surgery as waiting for the operation in the Netherlands threatened to become too long. The reply came immediately and mentioned the costs of transsexual surgery to be US $5000 "payable in cash upon arrival, if possible in travelers checks"(Fig. 7A, B). This price comprised "12–15 days hospitalization at the clinic, medical care and fees included, as well as the doctor's fee." This "handsome payment"[15] was certainly modest in view of the Benjamin's warning in the early 1960s that the price of vaginoplasty would go up in only a few months' time.[7] Moreover, Burou was willing to make enormous concessions to the financial plan whenever a case merited the operation.[14] The reply additionally asked to bring a report of the patient's "own doctor, with complete analysis made in a laboratory" and was signed by "La secrétaire du Docteur." Even though Burou, indeed, employed secretaries and directors for the Clinique, his second wife Lizette, who posed with him in the 1974 *Paris Match* article, was also reported to be closely involved in running the Clinique until she tragically succumbed to the injuries sustained in a fire in their private quarters, in 1979.[14,15]

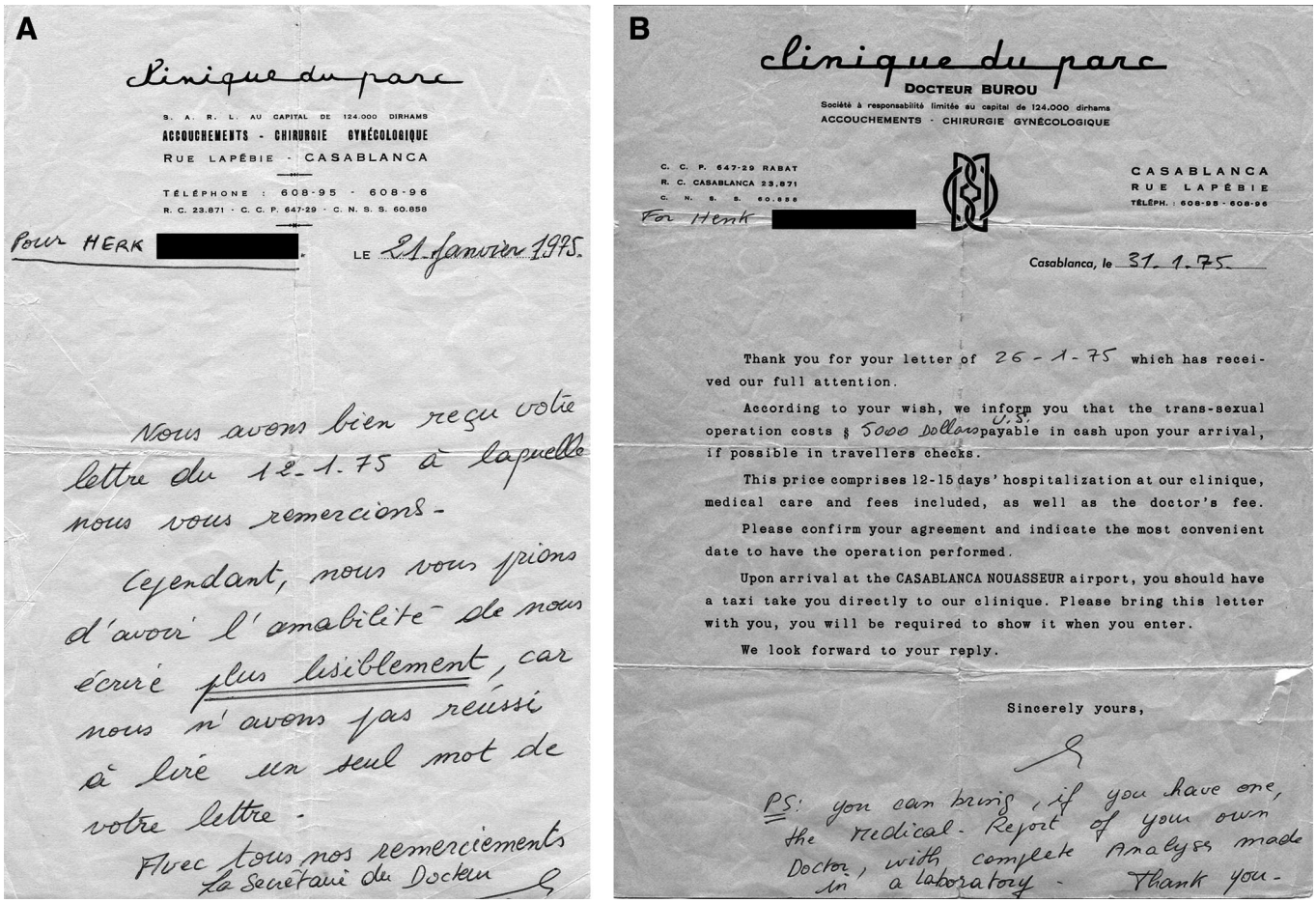

FIGURE 7. A, B, Copies of letters sent in January of 1975 by the secretary of Dr Burou to one of our patients who requested to be operated by Dr Burou. Instructions on workup, surgical fee, and traveling were included. Note that the letterhead of the clinic's stationery mimicked the lettering over the clinic's entrance (see Fig. 6B). A copy of a similar letter dated 1973 was found on http://www.inch.com/~kdka/stonewall/stone2.htm (accessed December 15, 2002).

DISCUSSION

In the early 1960s, centers in the United States had not yet become interested in sex-reassignment surgery, whereas European doctors reacted more forbiddingly than they had ever done since they started doing the surgery. They were frightened by the threat of publicity brought about by the Jörgensen case, repelled by a weird gallimaufry that pestered them along with the true transsexuals, and unsure of the legal implications.[15] In most countries, the law was hazy about the definition of sex and even obscurer about the legality of the act of changing it. Moreover, surgeons were afraid that their patients might regret the change and show behavior of a more psychotic type, besides very likely suing their surgeons for mayhem. In general, it was felt that the psychologic jolt of the operation would be so terrific and the later demands upon the patient so severe, that even the most sympathetic surgeons would not operate without years of pretreatment and observation. Benjamin knew of operations being done occasionally and secretly in the United States, occasionally in Mexico, and a few in Italy,[7] but for many transsexuals Casablanca had become the last resort to turn to for surgery.

In that same period, the penile skin inversion technique was said to be used exclusively by Burou, who emphasized that an uncircumcised penis was much more suitable than a circumcised one.[5] Even in 1973, when he presented his technique at Stanford University, Burou's was taken to be the first to have used "this new technique . . . utilizing the live graft which can be made from the penile skin when properly dissected,"[6] By then, his technique had been "reversely engineered" and adopted by surgeons throughout the world. Still, the penile skin inversion technique was reported, in 1957, in *The Principles and Art of Plastic Surgery* to have been used in a "pseudo male" by Gillies and Millard.[20] Their patient had previously undergone orchiectomy and had the penile skin flap "invaginated into a cavity artificially produced by dilation and blunt dissection between the urogenital membrane and anterior rectal wall."[20] After inquiries were made, D. Ralph Millard, MD, let us know that he and Gillies "got to the sex change work when well into the book which would indicate probably late 1952 or 1953. Gillies had a male cadaver brought into his consulting rooms and the inversion of the penile skin to make a vagina was carried out

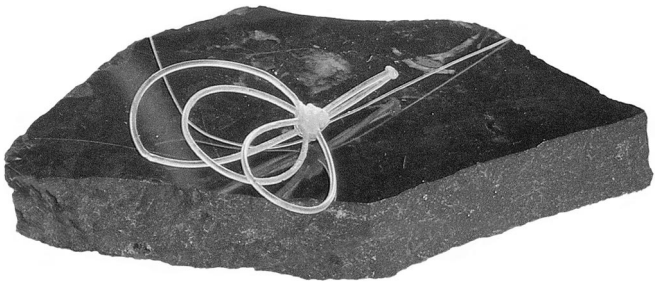

FIGURE 8. Example of Burou's intrauterine device, hand-tied from a length of fishing line, as exhibited as part of the Percy Skuy Collection on the History of Contraception at the Dittrick Medical History Center at Case Western Reserve University, Cleveland, OH. The description reads: "Made by a Docteur G. Burou in Casablanca who is a keen fisherman. This device was removed from a patient in Montreal." It was retrieved some 10 years after insertion (reprinted by kind permission from P. Skuy).[21]

in his consulting rooms. I was there. We used a piece of furniture for support in the execution of the operation" (Millard, personal communication, 2002).

By 1964, Benjamin and others had recognized Burou's technique as being "a rather ingenious method, reminiscent of the egg of Columbus."[5,20] Indeed, when Burou devised his innovating technique, he was totally unaware of any such work. He simply thought it to be the most logical and best thing to do.[6] It was not the only innovation devised by his genius. Inspired by the Arab habit of intrauterine application of pebbles in the uterus of their camels to prevent them from coming in calf, he developed a human intrauterine device made of nylon fishing line in the late 1950s (Fig. 8).[21] It took some 15 more years before the first American intrauterine devices became commercially available in Europe or Africa (Dr J. M. Donnadieu, personal communication, 2005). Likewise, long before such therapy became common in Europe in the 1980s, Burou started treating menopausal women with a combination of estrogens and progesterone in the early 1960s (Donnadieu, personal communication, 2005). Less genius personal results could not keep his interest for long. After working with the senior author (D.R.L.) in Palo Alto in 1973, Burou tried 3 female-to-male genital conversions, but he was not satisfied with his results, even though his patients were.[14] Consequently, he again restricted himself to male-to-female genital conversions.

By 1984, plastic surgical centers all over the world had embarked on sex reassignment surgery, and Burou was reported to consider this part of his work a side issue and to concentrate on obstetrics and gynecology.[13] He kept on working in the Clinique du Parc until December 17, 1989. That Sunday, he drowned outside of the harbor of Mohammedia when his boat ran out of fuel in stormy weather. His body was recovered 5 days after. Rather than cremating it to be scattered over his beloved ocean, his body was buried at the Ben M'Sick cemetery in Casablanca. By then, Docteur Georges Burou had rescued many hundreds, probably even over a thousand, male-to-female transsexuals from their wandering fate.[15]

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