

EDITORIAL

The Hour Lecture That Changed Sexual Medicine—The Giles Brindley Injection Story

The morning after the hotel bellboys were gossiping, there was a buzz in the elevators and the American Urological Association (AUA) officials were still in shock and trying to determine an appropriate course of action [1]. This was the morning after the one hour that would change the direction of sexual medicine forever. Your *Journal of Sexual Medicine (JSM)* publishes monthly peer-reviewed, multidisciplinary, basic science and clinical research studies to define and understand the scientific basis of male and female sexual function and dysfunction. There are times, however, that we in sexual medicine must reflect on the past in order to appreciate the present and better understand the future.

Aristotle once said, “If you would understand anything, observe its beginning and its development.” [2] I was lucky enough to “observe the beginning” (I was a cospeaker at the event), along with several hundred colleagues and their significant others. Recently, I was interviewed by my friend Dr. Abraham Morgentaler for a new book he is writing, and I was asked to recall the famous evening in 1983 when Giles Brindley injected himself at the AUA. I was surprised that my colleague was not fully aware of the significance or the details of that historic event. At that moment, I knew I had to share the story of the Giles Brindley injection and how it changed sexual medicine forever. To honor Giles Brindley and to preserve in our *JSM* the incident’s relevance to sexual medicine, this editorial focuses on Giles Brindley’s lecture on Monday, April 18, 1983, 7:00 PM, in Las Vegas, Nevada at the 78th Annual Meeting of the AUA [3,4].

“It is very hard to remember that events now long in the past were once in the future.” [2] I do not think Maitland knew how prophetic that would be when he said it. To place this in perspective, prior to 1983, there was limited knowledge about penile erectile physiology and very limited safe and effective pharmacologic treatments. The role of penile smooth muscle was not appreciated. Polsters or cushions around penile vessels were reported to relax to let blood in and

were thought to contract to trap blood during sexual arousal [5,6]. The AUA through its affiliate Urodynamics Society invited Professor Giles Brindley, an innovative British neurophysiologist, to “open our eyes” and provide an insightful lecture on the confusing state of erectile physiology.

Let me first say that the material and figures for this editorial are derived from a lecture I gave during the History Forum at the AUA, primarily written in the words of Brindley lecture attendees. In preparation for that lecture, I phoned, faxed, and sent e-mails to numerous colleagues and received responses from 48, including both text and photos (Figure 1). Thank you in particular to Han M. Hanify, Tom Lue, Alvaro Morales, William L. Perry, John Pryor, Jacques Susset, Tupper Stevens, and Emil Tanagho for their particular “historical” perspectives. The names of the 59 individuals I identified, who attended this lecture, are included at the end of the editorial.

Alan Wein wrote that he was the one who invited Brindley. “I needed someone who could talk about both lower urinary tract and erectile function. I asked Tony Mundy for advice. He told me about Professor Brindley and described him as very knowledgeable re: both, but a little odd. Professor Brindley gave no indication of his agenda. The folks at the AUA administration were not happy with my choice (after the fact), as there were a fair number of wives in the audience.” [7]

Jacques Susset was Vice President of the Urodynamics Society in 1983 and in charge of organizing an evening symposium on Sexology. “I had met Dr. Brindley sometime before at a supper in Boston, which was organized, I believe, by the late Dr. Alain Rossier. Dr. Brindley impressed me by his knowledge of neuropathology and particularly by his strong belief in penile injections for the treatment of erectile dysfunction.” [8]

There were 12 other speakers, including myself, at the 2.5-hour event and virtually no one remembers any of them or listened in detail to any of their talks. The impact of the Giles Brindley injection was too incredible (Figure 2).

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MONDAY, APRIL 18, 1983

Ballroom C, Hilton Hotel convention area—first floor
7 p.m. to 9:30 p.m.

URODYNAMICS SOCIETY

PHYSIOLOGY OF ERECTION AND MANAGEMENT OF IMPOTENCE

Moderator—Jacques G. Susset, Providence, R.I.

7 p.m.
Physiology of Erection and Ejaculation
Giles Brindley,* London, England

DISCUSSION
Emil A. Tanagho, San Francisco, Cal.
George S. Benson, Houston, Tex.
Mike B. Siroky, Boston, Mass.
Larry Beutler,* Tucson, Ariz.

8 p.m.
Evaluation and Management of Erectile Impotence: How I Do It
F. Brantley Scott, Houston, Tex.
William L. Furlow, Rochester, Minn.
Irwin Goldstein,* Boston, Mass.
Jerry G. Blaivas, New York, N.Y.
Nasem M. Siddiqi, Woonsocket, R.I.
Alan J. Wein, Philadelphia, Pa.

9 p.m.
Indications and Results of Penile Implants in Paraplegics
Alain B. Rossier and Subbarao V. Yalla, Boston, Mass.

Figure 1 Giles Brindley lecture at 7:00–8:00 PM on Monday April 18th 1983. Few remember anything about the presentations of the other 12 speakers.

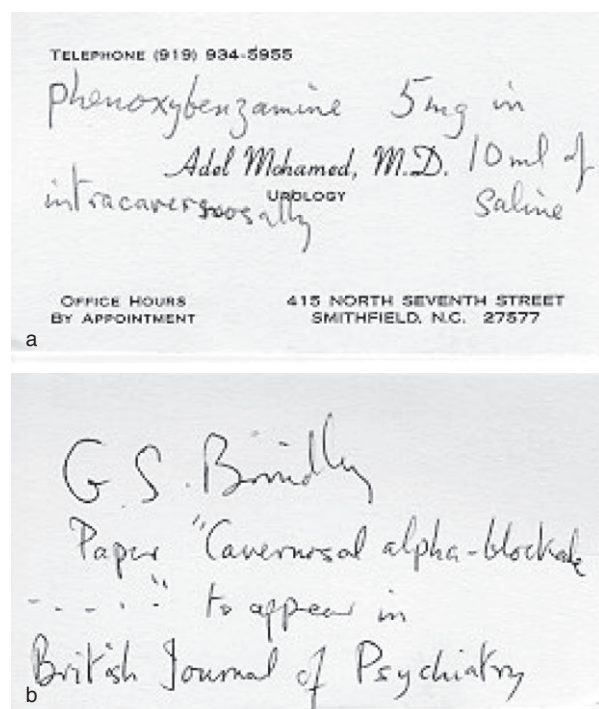


Figure 2 (a) Handwriting of Dr. G.S. Brindley describing the dose and the medication used to achieve the erection at the AUA meeting in 1983. (b) Handwriting of Dr. G.S. Brindley listing his publication that was *in press* at the time.

Robert Levin reminisced about the evening before. “He gave a talk on using rectal stimulation to stimulate erections. He received many questions and comments about his methods, and most of the audience were very skeptical (and verbal) about his results. Possibly—this is what induced him to give his vivid visual demonstration of the injection method.” [9]

Tom Lue acknowledged: “I won the first prize AUA basic research essay contest on neurostimulation and physiology of penile erection. I was really excited to attend the evening session of the Urodynamics Society, because my mentor, Dr. Tanagho, was scheduled to give a lecture on penile physiology. When I looked at the program, I saw Giles Brindley was also scheduled to talk about penile physiology. It was a big meeting room and crowded with people. I managed to get a good seat about 20 rows from the podium, so I could read every single word on the slides. At this meeting, everybody dressed formally with suits and ties.” Tom continued, “All of a sudden, I saw a gentleman with running shorts went up to the podium to start his talk. This English gentleman began to talk about his research in penile physiology. He showed many slides of stages of penile erection from flaccid state to full erection. And to

my surprise, he confirmed those were his own penis at different time points after stimulation.” [10]

When Jacques Susset inquired if Dr. Brindley’s erection was still present “he answered, ‘I think so’ and simultaneously he opened his zipper and exposed his penis in full erection to the attendance. In order to better convince the audience” Susset continued, “he stepped down the podium and, at everybody’s amused surprise, he started to circulate in the ranks. I remember some women were not amused and backed off with obvious fear as he nearly came in contact. I also remember the room which contained several hundred doctors and their companions to become extremely noisy which was not due to applause, but rather, signs of astonishment, if not panic.” [8]

Amy Steers, attending the lecture with her husband Bill, wrote later: “When Professor Brindley came to the podium wearing sweat pants everyone thought it was odd, but he was a steeple chase runner, and we thought just eccentric. The slide show, filled with a myriad of vasoactive drugs studies, showed pre- and post-injection penis photos. Then everyone gasped when he said that those were pictures of himself. By then people were noticing his sweatpants bulging and whispers were rampant. He then paraded down the aisle asking people to feel it to make sure it wasn’t a penile implant. By then all chaos broke out with laughing and everyone talking. I remember George Benson, Joe Corriere, Andy von Eschenbach, and Bob Krane were there that Monday night. Right after the demonstration Bob Krane said he made his very reluctant wife Bambi attend, to keep away from the gambling tables and shopping, but now he can’t get her to leave the symposium.” [11]

Norm Zinner sat in the front row between Frank Hinman and Jacques Susset about 20 feet from the lectern. Brindley “described the medication and the procedure and the lag time between injection and erection. After speaking for a fairly long time, he moved to his left and turned sideways and arched his back to accentuate the bulge in his sweat pants. He then related that he had injected himself and invited the audience to note it. He then pushed on his penis to show it was firmly erect, not easily bent. He then hopped down from the stage directly to Frank. He stood immediately in front of Frank and told him to touch it to see how firm it was. Frank demurred but I believe Jacques did. I did not.” [12]

Udo Jonas continued the story. “He next came down and walked through the aisle exhibiting the

penis and asked the audience to feel how rigid the penis was. I remember that he also wanted Emil Tanagho to do so, however Emil refused.” [13]

“I thought that Brindley was just the ultimate in British eccentricity on that night in 1983 in Las Vegas” explained Ira Sharlip. “Some of the crowd was offended and some people thought it was he was nothing more than a sexual exhibitionist. I think that I was sitting next to Arnold Belker at the event in 1983. When he told Brindley that phenoxybenzamine was not approved by the FDA because of tumors in lab animals, there was a great laugh in my area of the audience and a lot of comments about how Brindley’s penis was going to get cancer or fall off.” [14]

Emil Tanagho remembers that evening. “Needless to say, it was a moment of a great deal of excitement and almost disbelief from the audience of what was happening. After some time, the calmness was restored, I then took the podium to make my presentation. If there was any time where one speaker would stand up and say that this is a difficult act to follow that was the moment. I started, how could I compete with this kind of living demonstration of a totally new approach for pharmacologic induction of erection by intracavernous injections? However, my topic was equally exciting, Dr. Tom Lue’s work of implanting electrodes on the cavernous nerve to develop the first chronic animal model to study mechanisms of erection.” [15]

Word traveled quickly through the meeting and Han Hanafy “rushed to the meeting where Dr. Brindley was on the podium with an apparent ‘bulge’ in the front of his sweat pants. He was very serious about self-injecting his penis prior to the lecture with a substance we did not get its name. He walked around asking the audience to touch his erect penis to verify his statement. I don’t recall anyone touching him. By pure coincidence, Dr. Brindley sat next to us. My friend Adel and myself chatted with Dr. Brindley and asked him to write the medicine and dose he used. Dr. Mohamed gave him his appointment card and he wrote by his *handwriting* the phenoxybenzamine dose and upcoming article” [16] (Figure 3).

During the wee hours of the morning, Arnold Belker recalled, he heard about the hotel bellboys informing guests checking into the hotel about Brindley’s performance at the meeting! [1] When John Mulcahy shared his experiences from that AUA he recounted Joe Segura mentioning the episode during highlights of the previous day on the following morning [17]. “The next morning



Figure 3 Photos of Giles Brindley sent by his colleagues.

the event was the talk of the day,” said Wytze Hoekstra, “whether one had been there or not. I remember that many urologists from the USA disapproved.” [18]

William L. Perry recalled: “Dr. Earl Nation, President of the AUA in 1978 wrote the chapters on the AUA in its two volume Centennial History. Dr. Nation had reviewed all the documents and minutes of the AUA and remembers no action being taken officially about this event.” “Dr. Earl Nation told me he would not have been surprised about an ‘ad hoc’ meeting of AUA representatives with Dr. Frank Hinman Jr—then President of the Urodynamics Society.” “Dr. Hinman was called in early that morning and more than told how the Urodynamics Society had embarrassed the AUA. The issue of expelling the organization had to be confronted.” “The Urodynamics Society met during the day before the official opening of the annual AUA Scientific Meeting. Part of the Society’s arrangement with the AUA was that they would offer an evening program open to all interested attendees. The AUA provided a good-sized hall with speaker facilities and paid for our meeting room and the refreshments. I mention these amenities because our relationship with the AUA was jeopardized by this event.” [19]

What was the real significance of that evening? Wytze Hoekstra put it succinctly. “The Brindley lecture was one of the highlights in AUA history. A few lectures have an ever-lasting impact. One of them was: The future of mankind by Don Coffey. But also the Brindley lecture will never be forgotten by the guests of that performance. We were young urologists, who didn’t know very much about the state of the art in erectile dysfunction, so we went to that lecture to learn something about research and

clinical medicine. As for my friends and myself, we found it a superb method of advertisement.” [18]

Moreover, what was the impact of that evening? Physicians like myself, interested in treating erectile dysfunction, immediately included penile injections as part of their armamentarium, no longer limited to sex therapy and penile prostheses. Soon after the Brindley injection, we were training men with erectile dysfunction in our sexual medicine facility (mostly those with diabetes already used to needles) in self-injection therapy with papaverine and later with papaverine and phentolamine.

Tom Lue immediately researched the treatment. “After I came back from the AUA, the following Monday, I got my monkey and injected papaverine. The monkey had a great erection. A couple of days later, my associate, Dr. Richard Schmidt, had a patient presented with erectile dysfunction. Knowing that I had great success with the monkey, he gave the patient an intracavernous injection of papaverine. This was about 10 days after Dr. Brindley’s personal demonstration. We thought we were the first to use papaverine and then learned that Ronald Virag had published a paper on intracavernous injection of papaverine a year earlier.” [10,20,21]

Carolyn Earle recalled her mentor Ted Keogh doing something similar. “At that time we held a weekly ‘impotence management’ meeting and Ted reported to our group about Brindley’s injection. In hindsight, I think we all were a little aghast, but I remember Ted saying that it worked ‘beautifully.’ Ted was keen to try this new technique and after discussions with colleagues about this he did the first injection in Australia in 1984. There is no doubt in my mind that if Ted hadn’t been at that meeting he wouldn’t have started injecting so

quickly. Subsequent physicians came to Perth from all over Australia to learn about this technique.” [22]

Steve Wilson “always thought the Brindley injection revolutionized the treatment of impotence. For the first time we had a treatment besides prosthesis that we could offer patients. You remember we had only Yohimbine that was about as powerful as a teaspoon of honey. Because of the way he popularized it (by shocking the urologic community) knowledge of the chemical’s effectiveness became widespread quickly and changed the paradigm of impotence treatment. I went immediately home and tried to obtain the medication (papaverine). I was successful and began to use it cautiously in the office.” [23]

“The Brindley injection introduced pharmacological erection, like a baton twirler spear heading a parade down main street,” shared Harold Reed. “Not only were we given a therapeutic option, we were introduced to a better understanding of penile physiology, which paved the way not only for a more precise diagnostic evaluations, but also ensuing pharmacologic engineering which segued into the PDE 5 inhibitors. Lastly, the word got out that non-surgical treatments for ED could be efficacious.” [24]

Paul Abrahms still remembers the excitement. “It was a treasured memory of science transcending social norms. We need more of this type of intellectual purity!” [25]

What about the way in which Giles Brindley presented his revolutionary work? Norm Zinner said it best. “It was a magnificent way to emphasize a point (not intended as a pun) and create a stir. Indeed, in a way, he changed the world with that presentation. Had he simply written it up, it would also have gotten attention and ultimate acceptance but this was ‘showmanship’.” [12]

John Pryor contacted Dr. Brindley a few years ago about writing this history but he said that he had moved on and did not wish to write anything. Pryor says Brindley “emphasized that Virag published first but he had no knowledge of his discovery. He first injected himself on Sept 12 1982—one of the volunteers in the 1983 paper.” Pryor continued, “Giles is an original thinker; he lived and worked near me in Camberwell and would run the four miles up to the Institute to give his lectures. He held the over-65-year-old world record in Orienteering at one time but was thwarted in attempting the over-70-year-old record when he developed glaucoma and had to be atropinized. He is also a gifted musician, the bassoon.” [26]

Alvaro Morales put this in perspective: “Historians and the press have firmly anchored the concept of the sexual revolution in the decade of 1960’s. I care to disagree and believe that a bit historical revisionism is in order. What the 1960s brought to Western civilization was the coming out of the closet of sexual intercourse for non-reproductive purposes. This habit, of course, has been enjoyed by *Homo sapiens* and their ancestors for millennia but suppressed since the Dark Ages by religious zealots and Victorians. The true sexual revolution started specifically at 7 PM on Monday April 18, 1983 in (no surprise here) Las Vegas, Nevada.” Morales explained “post-Brindley the [erectile dysfunction] field was thrown wide open. Animal models were rapidly developed, intracavernosal therapy became the new standard of care, the physiology and pharmacology of the erectile process became understood. New drugs were developed. And here we are. . . . Humanity owes a great deal of gratitude to Giles Brindley’s brilliant mind (and to his penis) together with his knack for the dramatic. Without that spectacular *tour de force*, the process of showing and convincing the urological community what could be accomplished with delivery of vaso-active compounds into the corpora would have taken years if not decades to evolve.” [27]

In summary, the Brindley injection lecture was truly the one hour that forever changed the sexual medicine world. We all owe a great deal of gratitude to the AUA, to the Urodynamic Society, and to Giles Brindley himself for his spectacular, if not somewhat odd, presentation. Physiology and pharmacology of the erectile process was finally understood when the critical role of cavernosal smooth muscle relaxation became evident [28–31]. Intracavernosal therapy became the first pharmacologic, nonsurgical treatment option, long before the development of oral drugs. Moreover, almost 30 years later, we continue to use injection therapy as a safe and effective treatment for erectile dysfunction [32–34]. Brindley’s passion and personal attention to research detail allowed the field of sexual medicine to evolve exponentially.

To quote Kierkegaard, “Life must be lived forward, but it can only be understood backward.” [2] Your *JSM* is proud to represent the “best” in sexual medicine. It is with pride we recall the glorious past as we continue to discover the amazing future. Read for the *JSM*, cite the *JSM*, and send fascinating articles to the *JSM*. This is your sexual medicine journal. Moreover, please attend all sexual medicine lectures—so that one day you, too,

can report on a single hour that may again change the field of sexual medicine forever.

Acknowledgments

Based on e-mail inquiries, I am aware that the following individuals (listed alphabetically) were present at the Brindley lecture, Monday, April 18, 1983, 7:00–9:30 PM, Urodynamics Society, Ballroom C, Hilton Hotel, Las Vegas, Nevada, 78th Annual AUA: Paul Abrams, David M. Barrett, Arnold Belker, George S. Benson, Larry Beutler, Jerry G. Blaivis, Saul Boyarsky, Andrew Bruce, Paul Carpentier, Roy Correa, Joe Corriere, Hans de Wall William L. Furlow and wife, Donald Gleason, Irwin Goldstein, Ciril Godec, Han Hanafy, Frank Hinman, Wytze Hoekstra, Ted Keogh, Robert J. Krane and wife, Laurence Klotz, Robert Levin, Larry I. Lipschultz, Tom Lue, David Mitcheson, Abdel Mohamed, Alvaro Morales, Jacek Mostwin, John Mulcahy, Earl Nation, Leroy Nyberg, Kevin O'Connell, Theodore Ongaro, Udo Jonas, William L. Perry, Inder Perlash, Shlomo Raz, Harold M. Reed, Jim Roberts and wife, Alain Rossier, F. Brantley Scott, Ira Sharlip, Naeem M. Siddiqi, Mike B. Siroky, William Steers and wife, Jacques Susset, Emil A Tanagho, Andrew Von Eschenbach, George Webster, Alan J. Wein, Steven K. Wilson, Subharao Yalla, Norm Zinner, and Adrian Zorgniotti.

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References

- 1 Belker A. Personal communication May 27, 2006.
- 2 Szasz F. Quotes About History. In History News Network, December 26, 2005. Available at: <http://hnn.us/articles/1328.html> (accessed November 27, 2011).
- 3 Schultheiss D, Gline S. Highlights from the history of sexual medicine. *J Sex Med* 2010;7:2031–43.
- 4 Klotz L. How (not) to communicate new scientific information: A memoir of the famous Brindley lecture. *BJU Int* 2005;96:956–7.
- 5 McConnell J, Benson GS, Schmidt WA. The vasculature of the human penis: A reexamination of the morphological basis for the polster theory of erection. *Anat Rec* 1982;203:475–84.
- 6 Conti G, Virag R, von Niederhäusern W. The morphological basis for the Polster theory of penile vascular regulation. *Acta Anat (Basel)* 1988;133:209–12.
- 7 Wein A. Personal communication May 26, 2006.
- 8 Susset J. Personal communication May 29, 2006.
- 9 Levin R. Personal communication May 30, 2006.
- 10 Lue T. Personal communication June 13, 2006.
- 11 Steers A. Personal communication May 30, 2006.
- 12 Zinner N. Personal communication October 11, 2006.
- 13 Jonas U. Personal communication May 31, 2006.
- 14 Sharlip I. Personal communication May 29, 2006.
- 15 Tanagho E. Personal communication June 13, 2006.
- 16 Hanafy H. Personal communication May 30, 2006.
- 17 Mulcahy J. Personal communication May 27, 2006.
- 18 Hoekstra W. Personal communication June 9, 2006.
- 19 Perry W. Personal communication May 1, 2007.
- 20 Virag R. Intracavernous injection of papaverine for erectile failure. *Lancet* 1982;2:918.
- 21 Gline S, Virag R, Luis Rhoden E, Sharlip ID. Intracavernous injection of papaverine for erectile failure. *J Sex Med* 2010;7:1331–5.
- 22 Earle C. Personal communication June 16, 2006.
- 23 Wilson S. Personal communication May 29, 2006.
- 24 Reed H. Personal communication May 29, 2006.
- 25 Abrahms P. Personal communication May 30, 2006.
- 26 Pryor J. Personal communication July 5, 2006.
- 27 Morales A. Personal communication May 26, 2006.
- 28 Lue TF, Zeineh SJ, Schmidt RA, Tanagho EA. Neuroanatomy of penile erection: Its relevance to iatrogenic impotence. *J Urol* 1984;131:273–80.
- 29 Lue TF, Takamura T, Schmidt RA, Palubinskas AJ, Tanagho EA. Hemodynamics of erection in the monkey. *J Urol* 1983;130:1237–41.
- 30 Saenz de Tejada I, Goldstein I, Krane RJ. Local control of penile erection. Nerves, smooth muscle, and endothelium. *Urol Clin North Am* 1988;15:9–15.
- 31 Padma-Nathan H, Goldstein I, Azadzoi K, Blanco R, Saenz de Tejada I, Krane RJ. In vivo and in vitro studies on the physiology of penile erection. *Semin Urol* 1986;4:209–16.
- 32 Gratzke C, Angulo J, Chitaley K, Dai YT, Kim NN, Paick JS, Simonsen U, Uckert S, Wespes E, Andersson KE, Lue TF, Stief CG. Anatomy, physiology, and pathophysiology of erectile dysfunction. *J Sex Med* 2010;7:445–75.
- 33 Montorsi F, Adaikan G, Becher E, Giuliano F, Khoury S, Lue TF, Sharlip I, Althof SE, Andersson KE, Brock G, Broderick G, Burnett A, Buvat J, Dean J, Donatucci C, Eardley I, Fugl-Meyer KS, Goldstein I, Hackett G, Hatzichristou D, Hellstrom W, Incrocci L, Jackson G, Kadioglu A, Levine L, Lewis RW, Maggi M, McCabe M, McMahon CG, Montague D, Montorsi P, Mulhall J, Pfaus J, Porst H, Ralph D, Rosen R, Rowland D, Sadeghi-Nejad H, Shabsigh R, Stief C, Vardi Y, Wallen K, Wasserman M. Summary of the recommendations on sexual dysfunctions in men. *J Sex Med* 2010;7:3572–88.
- 34 Burnett AL, Goldstein I, Andersson KE, Argiolas A, Christ G, Park K, Xin ZC. Future sexual medicine physiological treatment targets. *J Sex Med* 2010;7:3269–304.