

## USE OF BURDIZZO CLAMP TO CRUSH VAS

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In 1910 Dr. Napoleone Burdizzo, an Italian veterinary surgeon, invented the instrument which carries his name, the Burdizzo bloodless castrator (fig. 1). It is a pair of pincers with a strong compound leverage action much like a heavy wire cutter, and may be obtained from any veterinary supply house. It is used to crush the spermatic cord within the scrotum, resulting in testicular atrophy within about 40 days. This instrument has been widely employed by farmers and veterinarians to castrate all sorts of animals, primarily calves, lambs, and goats. Reports from Aberdeen to Pretoria attest to its efficacy, and to the scarcity of unpleasant postoperative sequelae, including scrotal infections, hemorrhage, and blowflies.<sup>1</sup>

To carry out castration with the Burdizzo clamp, the animal is secured by one or several assistants, and the spermatic cord is palpated within the scrotum. The clamp is placed across the cord and closed. The procedure is then repeated on the opposite cord. The crushing action of the clamp actually bites the cord in two, whereas the skin, though flattened is not divided. It is a relatively simple operation, virtually always effective when properly done, and complicated only by an occasional scrotal slough occurring when sufficient care has not been taken to leave an isthmus of intact skin.

Dr. A. G. Danks of the New York State Veterinary College reports that the instrument has been in general use approximately 30 years. He states that, where animals are in filthy quarters, Burdizzo castration carries a lower incidence of postoperative infections than open castration. He further notes that the troublesome complications of its use are, first, that the cord may slip out of the clamp and not be crushed; and second, that if too much scrotal skin is crushed the entire scrotum may slough.<sup>2</sup>

In 1951 an attending physician on the Bellevue staff suggested that this ingenious device might be used in patients with advanced prostatic carcinoma, especially in those whose condition was so precarious that even the slightly more

elaborate procedure of open orchietomy might entail significant risk. Several Burdizzo orchietomies, or clamp castrations were performed on the Cornell urology service of Bellevue Hospital, and reported upon by Dr. R. G. Wiggans.<sup>3</sup> It was found that the procedure could easily be performed without moving the patient from his bed, using local procaine anesthesia. There were no significant postoperative complications. Testes removed at autopsy or later orchietomy showed varying degrees of atrophy, not always complete.

In 1952 it was decided to try crushing the vas deferens with this clamp in place of doing the routine open partial vasectomy. Accordingly, 200 vasectomies, on patients to be subjected to transurethral prostatic resections, were done with the Burdizzo clamp. These cases have been compared with the 200 immediately preceding resection in which open vasectomy was done.

### PROCEDURE

After routine preparation of the skin with merthiolate or phisohex and zephiran, the vas deferens is picked up between the fingers, in the upper scrotum, and a towel clip placed through the skin and around the vas, an effort being made to include as little excess tissue as possible. Another towel clip is placed around the vas about  $\frac{1}{2}$  cm. from the first (fig. 2, A). The "lamb" sized Burdizzo clamp is then applied between the towel clips, the scrotum extending for about 1 cm. into the jaws of the clamp. The clamp is then closed tightly (fig. 2, B). The instruments are removed and the operation completed. The procedure is repeated on the opposite side. When the clamp is closed there is a definite crunching sensation as the vas is crushed. The vas can then be felt to have been completely flattened for a distance of approximately 3 mm. The entire procedure takes less than a minute.

### RESULTS

Two hundred resections have been done using the vas crush instead of open vasectomy. They have been done during 1952 through 1956, by

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<sup>1</sup> Brochure supplied with Burdizzo instrument.

<sup>2</sup> Danks, A. G.: Personal communication.

<sup>3</sup> Wiggans, R. G.: Essay read in resident's competition sponsored by New York Section of American Urological Association, Inc.

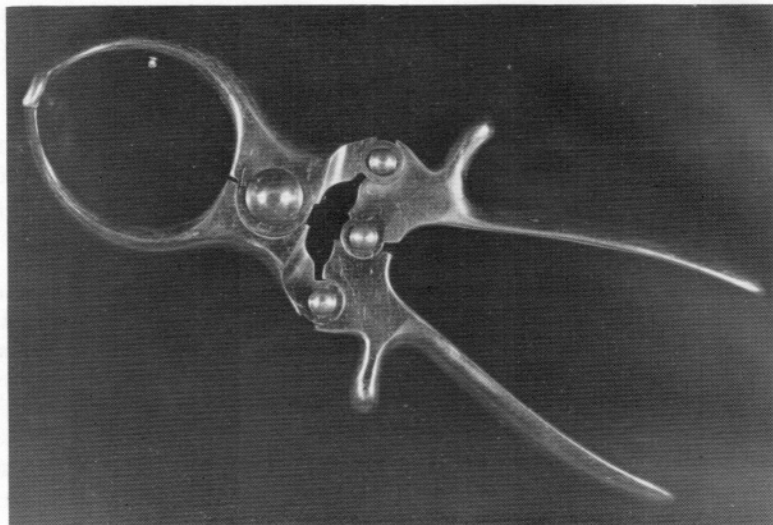


FIG. 1

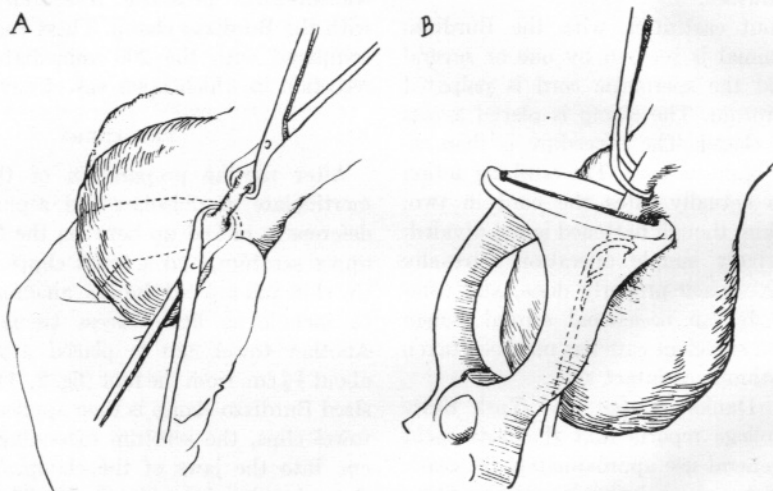


FIG. 2

successive residents at Bellevue Hospital. It is perhaps significant that residents introduced to the procedure have continued to use it despite a lack of any compulsion to do so. The 200 resections done in 1951 through 1953, immediately preceding and concurrent with the vas crush series, and in which open vasectomy was routinely done, were analyzed for comparison. Pre- and postoperative sulfonamides were used routinely in both series, and other antibiotics used occasionally in both. Epididymitis developed in 3.5 per cent of the vas crush patients, and 7.5 per cent of the open vasectomy cases. Vasitis was

more common (2.5 per cent) in the vas crush cases, but never presented a serious problem. No other related complications were recorded (tables 1 and 2). These statistics are listed below, with comparisons from the literature.

Segments of vas were removed in several cases immediately after crushing. The crushed portion, about 3 mm. wide, was so thin as to be translucent. Fluid injected into the lumen of the vas under moderate pressure would not pass this point. Extreme pressure caused fluid to leak out at the point of crushing, but not to pass through into the remainder of the vas. Segments removed

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TABLE 1. *Transurethral prostatic resections*

	Bellevue Group				Schmidt and Hinman	Lynn and Nesbit
	Open Vasectomy		Vas Crush		Vasectomy	Vasectomy
	#	%	#	%		
Total cases	200		200		188	300
Epididymitis (No. cases)	15*	7.5	7*	3.5	2.66%	2.67%
Vasitis	0		5	2.5	4.68%	0
Other complications (hematoma, abscess, etc)	1	0.5	0		4.38%	1%
Total complications	16	8	12	6	11.72%	3.67%

\* One bilateral.

TABLE 2. *Epididymitis after vas crush*

Time after operation	Severity
2 dys.	mild
8 dys.	mild bilat.
2 mos.	moderate
3 wks.	mild
8 dys.	severe
5 dys	severe
4 mos.	moderate

a week after crushing showed a small knot of scar tissue. Fluid injected under moderate pressure would not pass this point, but extreme pressure would again cause fluid to leak out at the point of the crush. Segments removed a month after crushing were impermeable to fluid.

DISCUSSION

Vasectomy for the prevention of epididymitis has been done since 1896. A closed method of vasoligation was worked out in 1928 by Colston and Alyea who passed a catgut suture through the scrotal skin, around the vas, and back out through the skin, then tying it tightly enough to occlude the vas.<sup>4, 5</sup> This procedure has largely been abandoned, perhaps prematurely so. One problem has been the time at which to remove the suture, epididymitis having followed suture

<sup>4</sup> Alyea, E. P.: *J. Urol.*, **19**: 65, 1928.

<sup>5</sup> Colston, J. A. C.: Discussion of McKay paper (*South Med. J.*, **21**: 799, 1928).

TABLE 3. *Closed vasoligation*

Author	No. Cases	No. Cases of Epididymitis	%
Alyea ( <i>J. Urol.</i> , <b>19</b> : 65, 1928)	50	2	
McKay ( <i>South. Med. J.</i> , <b>21</b> : 799, 1928)	33	5	
Pugh (Cited by Abeshouse, <i>Am. J. Surg.</i> , <b>32</b> : 8, 1936)	125	17	
Reed (Cited by Abeshouse)	6	3	
	214	27	12.6

removal in several instances. A summary of the reported cases shows an average of 12.6 per cent epididymitis after the procedure (table 3).

In 1950 Schmidt and Hinman<sup>6</sup> summarized the effect of vasectomy on epididymitis following resection. They concluded that epididymitis developed in 9.06 per cent of resections without vasectomy, 2.66 per cent of those with vasectomy. This difference was considered statistically highly significant.

Complications of open vasectomy developed in 4.38 per cent of Schmidt and Hinman's cases, including abscess, hematoma, wound infection or disruption. Vasitis occurred in 4.68 per cent of vasectomies (table 1). They pointed out that epididymitis probably would have developed in these cases had not ligation been done, and should hardly be considered as complications of vasectomy.<sup>6</sup>

Lynn and Nesbit<sup>7</sup> found epididymitis in only 4 per cent of resections without vasectomy, 2.7 per cent of resections with vasectomy, and a 1 per cent incidence of complications from vasectomy.

Abeshouse reported epididymitis in an average of 6 per cent of resections without vasectomy.<sup>8</sup>

Rolnick's work on dogs indicated that transverse incisions of the vas deferens, to which the vas crush may be fairly comparable, usually did not recanalize.<sup>9</sup>

There is no doubt that in a certain number of patients unsuspected latent infection of the

<sup>6</sup> Schmidt, S. S. and Hinman, Frank: *J. Urol.*, **63**: 872, 1950.

<sup>7</sup> Lynn, J. M. and Nesbit, R. M.: *J. Urol.*, **59**: 72, 1948.

<sup>8</sup> Abeshouse, B. S.: *Am. J. Surg.*, **32**: 8, 1936.

<sup>9</sup> Rolnick, H. C.: *J. Urol.*, **14**: 371, 1925.

epididymis exists, even prior to surgery or instrumentation. This latent infection might be expected to flare up regardless of, or even because of interruption of the vas, and probably accounts for the observed failures. It is believed, though not proven, that the crushed vas seldom if ever recanalizes.

The amount of necrotic tissue left by the vas crush, in which vasitis might develop, is no greater than that left in open vasectomy. Leakage of infected urine or prostatic fluid from the site of vas crush might, if it happened clinically, be presumed to cause vasitis or local scrotal inflammation. As stated, the 2.5 per cent incidence of such inflammation has not been a serious problem.

#### CONCLUSION

The Burdizzo vas crush appears to prevent epididymitis following resections at least as well as does open vasectomy. The 3.5 per cent epididymitis following the crush is not significantly different from either Schmidt and Hinman's figure of 2.66 per cent or the 7.5 per cent found in our more comparable series, since the difference between the percentages is less than twice the standard error of this difference. The vas crush

takes less than a minute, compared with about 10 minutes for open vasectomy. The complications of the vas crush have been minimal. Scrotal abscess, hematoma, wound infection and disruption have not occurred, nor would they be expected. Ecchymosis developed in one patient operated upon too recently to be included in this series. Vasitis has appeared in 2.5 per cent, comparable to the aforementioned figure of 4.68 per cent in open vasectomy.

We have not used the Burdizzo clamp extensively in open prostatectomies, or in doing vas interruption on first instrumentation, but both are easily done.

#### SUMMARY

Interruption of the vas deferens has been widely accepted as valuable in minimizing the epididymitis that often follows prostatic surgery. The Burdizzo bloodless castrator, a veterinary instrument, has been used in 200 cases of transurethral prostatic resection, to interrupt the vas by crushing it. In comparison with routine open partial vasectomy, this procedure appears to be just as effective, a great deal quicker and easier, and less subject to complications.

8 Prospect St., Dover, N. J.