

The Pericervical Broad Ligament Tourniquet for Preventive Hemostasis in Myomectomy

I. C. RUBIN, M.D.

THE USE OF an elastic rubber tourniquet to prevent operative bleeding in pelvic surgery is not new. It was employed by Porro at the end of the last century in the Porro cesarean hysterectomy and by some of his contemporaries in hysterectomy for tumors of the nongravid uterus. Sporadically the tourniquet was even used for myomectomy by some gynecologists and surgeons. But the systematic employment of the trans-broad ligament pericervical tourniquet for preventive hemostasis in myomectomy is comparatively recent.^{3, 4} Borras began using it shortly after observing different technics to prevent bleeding during myomectomy, which were employed on my service at Mount Sinai Hospital. These included (1) rubber-covered clamps applied to the broad ligament, (2) bilateral temporary ligatures of the uterine and ovarian vessels on either side, and (3) temporary bilateral compression of the vessels by narrow Bullet forceps applied to the cervix. The special uterine artery clamps of Bonney were also occasionally employed.

The prevention of hemorrhage in myomectomy marks one of the decisive advances in the conservative treatment of

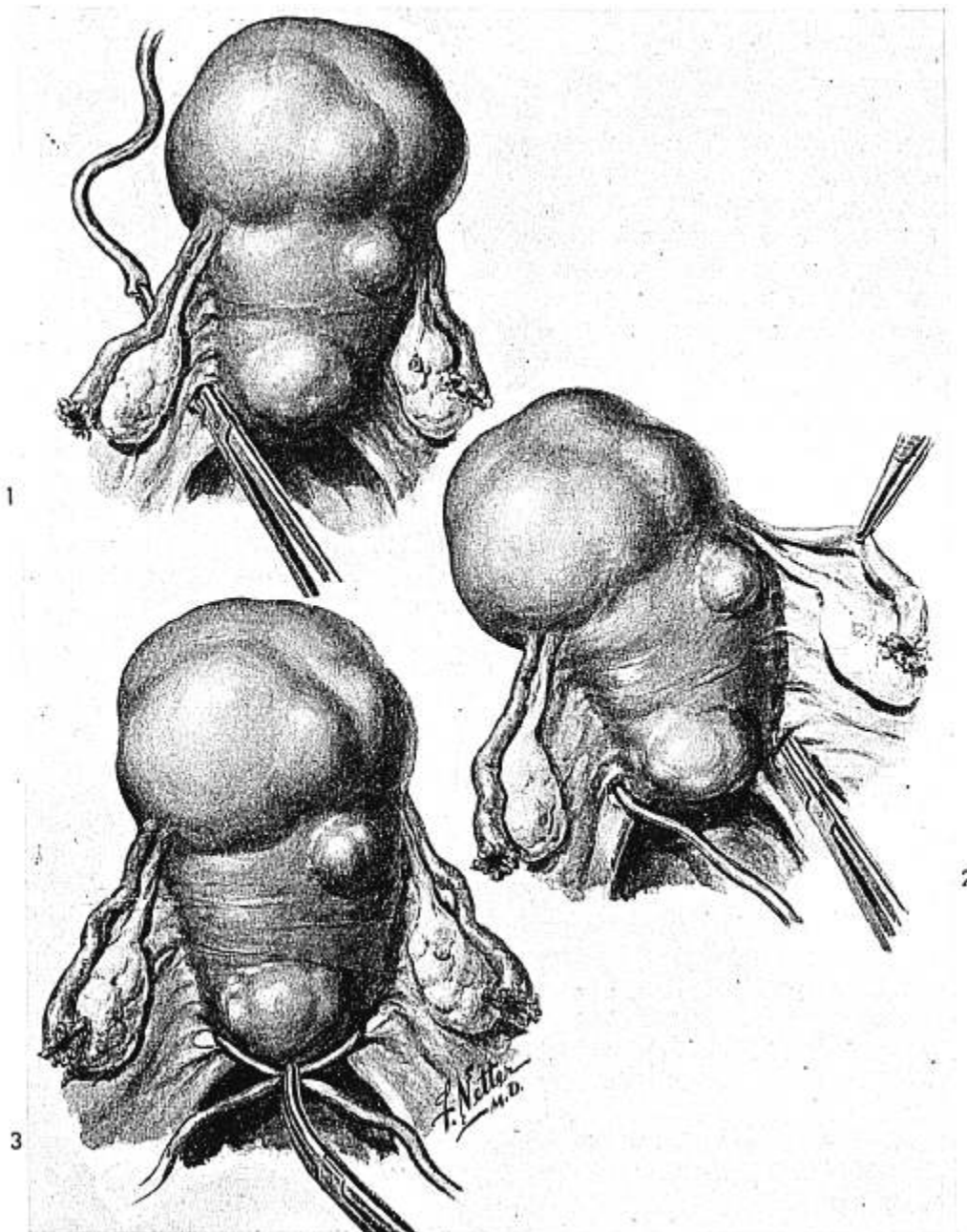
uterine fibroids. One of the important reasons why myomectomy was not generally adopted was fear of hemorrhage, which was inadequately controlled by most of the early measures previously used when removal of many tumors from the same uterus was attempted. Adoption of the pericervical rubber tourniquet has met the requirements of a satisfactory hemostatic, permitting the removal of many fibroids, sometimes more than 30 being removed. Properly applied, the tourniquet enables the surgeon to remove the myomata without serious blood loss, and in the vast majority of myomectomies, with practically no blood loss.

Its application under favorable circumstances is simple and suitable for most cases. The tourniquet should be new and should consist of reliable tensile rubber tubing with the diameter and thickness of a No. 8 French rubber catheter; its length should be about 12 inches. By means of a Kelly clamp or similar instrument a small hole is made through an avascular area in the broad ligament about $\frac{3}{4}$ to 1 inch away from the left lateral wall of the uterus at or just above the level of the internal os. One end of the rubber tourniquet is grasped with the Kelly clamp and pulled through to the posterior aspect of the broad ligament (Fig. 1). A similar hole is made on the right side, also at an avascular area, and the other end of the tourniquet is drawn through to the pos-

From the Department of Gynecology and Obstetrics, Mount Sinai Hospital, New York 29, New York.

Presented at the First Annual Clinical Meeting of the American Academy of Obstetrics and Gynecology, December 15, 1952.

PREVENTIVE HEMOSTASIS IN MYOMECTOMY



Figs. 1-3. The method of applying the elastic tourniquet is shown in three steps. Courtesy of Ciba Company and Dr. Frank Netter.

terior surface of the broad ligament (Fig. 2). The ends are held taut and crossed snugly at the posterior uterine surface where the tourniquet is clamped by a toothless, but firm, grasping instrument (Fig. 3). This

produces an ischemia of the uterus by constricting the uterine vessels on both sides. The uterine incision may now be made without appreciable blood loss. The only escape of blood is that contained within the uterine

walls and the myomatous tumors at the time the tourniquet is applied. To reduce this loss of passively retained blood, pituitrin may be injected into the uterus prior to the tourniquet application. The incisions and enucleations may now be made without fear of hemorrhage.

It is of considerable advantage to combine other technical advances of myomectomy, such as limiting the number of incisions, subcapsular enucleation after hemisection of the myomata, immediate suture of the uterine wounds, and wound protection by vesico-uterine peritoneum, temporary ventrofixation, or covering the posterior uterine wall wounds with sigmoid serosa or sigmoid epiploica. These have been described elsewhere.

After myomectomy and suture of the uterine wounds, the tourniquet is removed and the small oval rents made into the broad ligament are sewn by simple plain catgut sutures on either side, front and back.

The application of the pericervical broad ligament tourniquet enables the surgeon to remove all the fibroids thoroughly, bloodlessly, and expeditiously. Most of the tumors can be enucleated, and the cavities left in the uterine walls sewn up within 10 minutes, the optimum time for tourniquet application. If the tumors exceed 6 or 8 in number and require more than one incision because of their wide dissemination, and more than 10 minutes for their removal, the tourniquet should be loosened while the uterus is held firmly in a hot, moist compress for about a minute, after which the clamp may be re-applied to the crossed and taut tourniquet as before for 10 minutes more, as the case requires. I have had occasion in 1 case to enucleate 89 fibroids and on other occasions, 20 and more tumors.

Once the technic is mastered, the time required for multiple myomectomy, even in the more complicated cases, does not exceed the average time for hysterectomy. As no appreciable bleeding takes place during the

procedure, the time element is unimportant.

It should be pointed out that the application of the pericervical broad ligament tourniquet is not adaptable in all cases. The tourniquet is not applicable in the presence of perimetritic adhesions and massive endometriosis with chocolate cysts. If a serious attempt is made to do a conservative operation in such cases, the myomectomy should be preceded by an attempt to remove the diseased tissues in order to determine whether the tubes and a sufficient amount of normal ovarian substance can be conserved. The adhesions surrounding the uterus to the adjacent intestines must also be removed. If the possibility of covering all denuded areas is good, the myomectomy can be done with the aid of the rubber tourniquet, as in uncomplicated cases.

When an intraligamentous fibromyoma is present, and the uterus itself is occupied by many fibroids, the tourniquet can be used to advantage to remove the latter, after which the intraligamentous tumor can be enucleated subcapsularly after incising the vesico-uterine peritoneum and freely dissecting and separating the bladder attachment. The technic of removing the intraligamentous tumor is the same as that of removing any other large uterine fibromyoma.

As the aim and object of myomectomy are to conserve reproduction as well as menstruation for the nulliparous woman who strongly wants to have children, it is of interest to note how many women operated on for multiple fibroids became pregnant. There were 29 patients from whom more than 5 fibroids were removed with the aid of the tourniquet. Of these, 5 became pregnant and 1 was delivered of twins. The rest went on to menstruate normally for varying periods of time, depending on the age at which the myomectomy was performed. The fact that 1 in 6 became a mother besides keeping her uterus appears to justify multiple myomectomy.

PREVENTIVE HEMOSTASIS IN MYOMECTOMY

The upper age limit at which multiple myomectomy is undertaken has gradually been advanced so that it is not uncommon to operate upon a nulliparous woman of 40 years and over. The multiplicity of tumors is no contraindication as all but the smallest seedling myomata, which may be overlooked, can be removed at one time. Sarcoma, if suspected or actually substantiated by frozen section, is not an absolute contraindication as a number of women with this complication have been successfully operated on to become mothers without recurrence after the enucleation. The presence of a carcinoma, either of the cervix or of the body of the uterus, is an absolute contraindication to myomectomy. It can be excluded or diagnosed by pre-operative examination with the Papanicolaou smear, cervical biopsy, and a hystrogram, with or without an exploratory curettage or suction endometrial biopsy.

In the 59 cases in which the tourniquet was used, the number of tumors was recorded in 50. The average number of tumors removed was 8.07. The tourniquet was applied only in cases having multiple tumors or for very large intramural growths. There were 30 cases with 5 to 10 tumors, 10 cases with 10 to 15 tumors, 7 cases with 15 to 20, and 3 cases with 20 or more tumors; the greatest number of myomas encountered in 1 patient was 89. I agree with Bonney's statement that "the mere quantity of

fibroids in a uterus does not bar conservative operation."

SUMMARY

The most important progress made in myomectomy in the last two decades has been in preventive hemostasis during the operation. One of the most effective operative hemostatic measures is the pericervical tourniquet, which controls blood loss and makes possible the removal of many fibromyomata from a single uterus. By its use shock from hemorrhage is completely obviated. Combined with other technical advances in myomectomy, the application of the broad ligament tourniquet has made myomectomy at least as safe as hysterectomy. This technic has been used in over 50 cases of multiple myomectomy involving the removal of many tumors from individual patients in the last 12 years with satisfactory results.

REFERENCES

1. BONNEY, V. On conservation of function in gynecology. *J. Mt. Sinai Hosp. (Rubin Anniversary Volume)* 14:152, 1947.
2. BORRAS, P. E. Preliminary Hemostasis as an adjuvant in the conservative surgery of the Uterus. *J. Mt. Sinai Hosp. (Rubin Anniversary Volume)* 14:159, 1947.
3. RUBIN, I. C. Technical Principles in Myomectomy with special reference to Hemostasis. *J. Mt. Sinai Hosp.* 17:565, 1951.
4. RUBIN, I. C. La Myomectomie en vue de la grossesse, plus particulièrement du point de vue de l'hémostase à l'aide d'un tourniquet péricervical. *Semaine d. hop. Paris.* 22 Novembre, 1952, 28 Année, No. 86.