

Reversal of 'Sterilization due to Application of Quinacrine by Means of Transcervical Tubal Catheterization'¹

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Index terms: Fallopian tubes, interventional procedure, 853.1269 • Interventional procedures, 853.1269 • Sterility

JVIR 1995; 6:147-149

PLACEMENT of quinacrine in the uterus is an effective, low-cost method of nonsurgical sterilization that has been used in more than 50,000 women since 1980 (1,2). Placement of 252 mg of quinacrine hydrochloride in pellet form in the fundus of the uterus by means of a modified intrauterine device inserter produces inflammation and subsequent fibrosis limited primarily to the intramural portion of the fallopian tubes (3). As demonstrated with hysteroscopy and hysterosalpingography, this procedure results in 90% occlusion of the tubes after one insertion and 100% occlusion after two or three insertions 1 month apart (3). Compared with surgical tubal ligation, intrauterine quinacrine has a higher life-table failure rate at 1 year: 2.6% compared with almost 0% for tubal ligation. But use of quinacrine results in less morbidity and mortality, and it is much less expensive than surgical methods. However, the quinacrine method has been considered irreversible because of the cornual and intramural scarring (3).

Radiologic selective salpingography and fallopian tube recanalization have been used since 1985 for nonsurgical reversal of intramural tubal occlusions; worldwide, this method has an 82% success rate for establishing proximal tubal patency (4). It has been assumed that, although patency can be achieved in those tubes occluded by debris or light adhesions, fibrosis probably is not amenable to catheter-guide wire recanalization.

CASE REPORTS

Of approximately 10,000 women who had undergone sterilization with quinacrine in Calcutta and surrounding rural areas in India, three women desired reversal of sterilization be-

cause their children had died. Information about these women was obtained through a system of rural medical workers who report to the Indian Rural Medical Association. This association is under the direction of one of the authors (B.M.). Transcervical catheterization with recanalization was offered to these patients as an experimental method to unblock their fallopian tubes, and they gave informed consent for the procedure. In one patient, for reasons not understood, the cervical canal could not be catheterized. Therefore, the procedure could be performed in only the other two patients, both of whom had lost two children.

Both patients first underwent hysterosalpingography for documentation of bilateral intramural tubal occlusion. Patient 1 was 28 years old and had a 5-year history of sterilization following three treatments with 252 mg of quinacrine. Patient 2 was 22 years old and had a 2-year history of sterilization following two treatments with 252 mg of quinacrine.

The catheterization procedures were performed in an outpatient radiology facility in Calcutta. The equipment included a hysterosalpingographic device (Thurmond-Rosch HysteroCath, size 250; Cook OB/Gyn, Spencer, Ind) and a coaxial uterine catheterization set (Touhy-Borst adaptor; 31.5-cm 9.0-F Teflon catheter with Check-Flo; 5.5-F braided polyethylene torque-control catheter 50 cm long with a 3-cm nonbraided tip; stainless steel guide wires 0.035 inches (0.89 mm) in diameter and 90 cm long, one with a 1.5-mm Safe-T-J tip and one with a 10-cm flexible tip [all by Cook OB/Gyn]). It also included three different tubal catheterization systems: (a) a 3.0-F Teflon catheter that is 65 cm long and a stainless steel Cope Mandril guide wire 90 cm long and

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0.015 inches (0.38 mm) in diameter with a platinum tip from (Cook OB/Gyn); (b) a 90-cm Tracker-18 catheter and a 125-cm Taper steerable guide wire (Target Therapeutics, San Jose, Calif); and (c) a variable-softness catheter and a Pirhouette guide wire (Conceptus, San Carlos, Calif).

With the patient in the dorsal lithotomy position and with aseptic technique, a vaginal speculum was placed, and the vagina and cervix were swabbed with antiseptic solution. The cup of the HysteroCath was placed on the external cervix, and a vacuum was applied with a 50-mL syringe with a stopcock. A series of catheters were then advanced into the uterus and fallopian tube with fluoroscopic guidance and coaxial technique (Fig 1). The 5.5-F catheter was advanced into the tubal ostium with the help of the 0.035-inch-diameter J-tip guide wire, followed by the 0.035-inch straight guide wire. The guide wires were removed, and water-soluble contrast medium was injected directly into the cornu to confirm intramural tubal occlusion. Recanalization was then attempted by using the smaller guide wires supported by the smaller catheters. Water-soluble contrast medium was again injected directly into the tubal ostium to help visualize tubal anatomy (Fig 2).

The patients were given a 100-mg dosage of doxycycline to be taken orally twice a day for 5 days, and they were instructed to contact the author (B.M.) if they experienced any complications or if menstruation was delayed for more than 15 days.

In patient 1, recanalization of a 2-cm "gritty-feeling" occlusion of the proximal right tube was successfully accomplished by using catheterization system a and then b; a tortuous but otherwise normal-looking tube was revealed (Fig 1). Attempts at recanalization of the left tube with catheterization system a resulted only in venous intravasation, and no further attempts were made on this side.

In patient 2, recanalization of a similar 2-cm gritty occlusion of the proximal right tube was accomplished by using all three catheterization systems in sequential order; this procedure resulted in a patent tube (Fig 2).

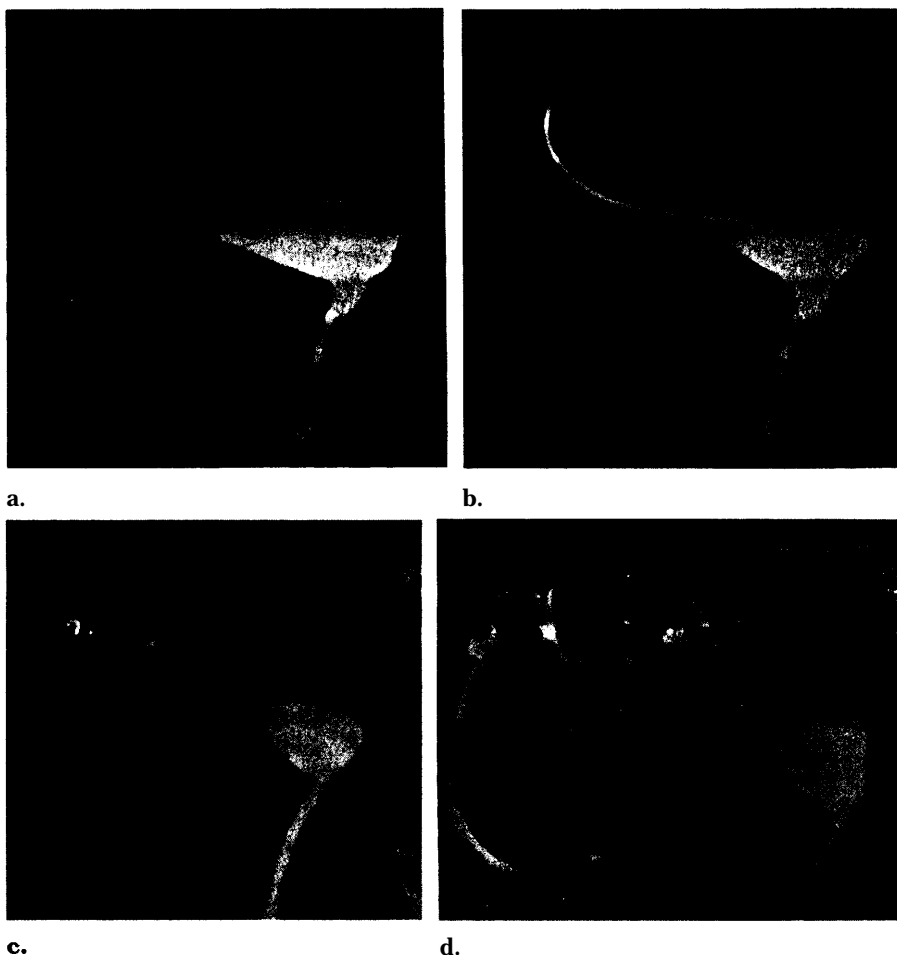


Figure 1. Patient 1. Successful recanalization of the right fallopian tube is demonstrated in a patient who had a 5-year history of sterilization due to uterine application of quinacrine hydrochloride. (a) Selective salpingogram obtained before recanalization with the tip of the 5.5-F catheter in the tubal ostium demonstrates occlusion at approximately the interstitial-isthmic junction. (b) The advancement of guide wire a through a "gritty-feeling" occlusion is demonstrated. (c) Partial recanalization of the tube is demonstrated. (d) After advancement of the softer catheter-guide wire system b, the tube is tortuous but widely patent.

Attempts at recanalization of the left tube with catheterization system a again resulted only in venous intravasation, and no further attempts were made.

DISCUSSION

In two patients with iatrogenic, bilateral tubal occlusion caused by treatment with intrauterine quina-

crine, recanalization of one tube in each patient was accomplished with a catheterization system under fluoroscopic guidance. This finding is important because of the implications regarding catheter-guide wire recanalization as well as the quinacrine method of sterilization.

One can conclude that catheterization with fluoroscopic guidance can be used to recanalize some proximal tubes affected by fibrosis. Because re-

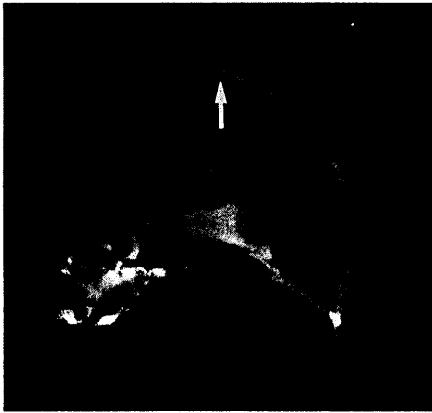


Figure 2. Patient 2. Selective salpingogram obtained after successful catheter-guide wire recanalization of a fibrotic proximal occlusion caused by quinacrine sclerosis reveals a patent tube. Arrow indicates the tip of the ostial catheter.

canalization by means of catheterization methods leaves the tube intact and does not yield a surgical specimen, the exact cause of the occlusion in successfully recanalized tubes has been unknown. It has been assumed that a tube can be successfully recanalized by means of catheterization only when the occlusion is due to debris or light adhesions, not when the occlusion is due to fibrosis (4). However, it is known that the underlying occlusion that results from sterilization with quinacrine is due to fibrosis in the intramural portion of the fallopian tubes (3). It is therefore reasonable to assume that this was the cause of occlusion in the two patients in this report; in both patients, bilateral cornual occlusion was demonstrated with hysterosalpingography and selective salpingography, and both had a history (2 and 5 years) of effective sterilization. Also, the gritty sensation dur-

ing guide-wire recanalization and the 50% failure rate of recanalization are consistent with expected findings for fibrotic occlusion.

Quinacrine sterilization is a developing technique that is geared toward providing safe, low-cost, permanent sterilization. Initially it was believed that it was necessary to perform three applications to achieve tubal occlusion, but later it was found that two applications were sufficient. This is the reason that three applications had been performed in the first patient 5 years ago, and only two applications had been performed in the second patient 2 years ago.

Because of its presumed irreversibility, the quinacrine method of sterilization has not been available to women in some Muslim countries, such as Egypt, or in Indonesia, where the national family-planning programs require that sterilization methods be reversible. Application of quinacrine in the uterus causes fibrosis deep in the intramural portion of the tube, which is not easily accessible for surgical resection and reanastomosis, even in patients who could afford it. The ability to reverse sterilization with quinacrine by means of transcervical catheterization may improve the acceptance of this method, and interventional radiologists may be asked to perform tubal recanalization in those patients who desire reversal of sterilization.

The establishment of tubal patency is necessary for subsequent conception, but it does not guarantee conception. The postprocedure salpingograms of the two tubes that were successfully recanalized demonstrated patent tubes, which is a promising finding. However, the microscopic findings are unknown, and the patients may have developed pelvic ad-

hesions or other factors affecting fertility since their prior deliveries. The occurrence of a normal intrauterine pregnancy in these two women would help establish the usefulness of transcervical catheterization in the reversal of sterilization. If pregnancy did not occur, this finding would, unfortunately, be inconclusive because of the small number of patients.

This standard technique for tubal catheterization has been described by numerous authors (4). We used three different combinations of catheters and guide wires. A relatively stiff but flexible system such as a or c is probably beneficial in the negotiation of the fibrotic area, and a softer, more tapered system such as b is probably helpful in the advancement of the catheter and guide wire into the isthmus portion of the tube if necessary.

Acknowledgments: The authors thank Dexter Elkins of Cook OB/Gyn for donation of equipment and Julian Nikolchev of Conceptus for donation of equipment and funding of travel.

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Letter

Percutaneous Portal Vein Thrombolysis

From: Ziv J. Haskal, MD
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Editor:

I enjoyed the excellent article and commentaries regarding percutaneous portal vein thrombolysis by Durham et al (1) and Darcy (2). Another prior report of the

successful use of this technique combined with stent placement in a postoperative liver transplant recipient has been published in *JVIR* (3). At 21-month follow-up, that patient remains free of symptoms; her portal vein remains widely patent.

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