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Inflatable Penile Prostheses

*The American Medical Systems' Experience*

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Until the early 1970s, most impotence, or what is now known as erectile dysfunction (ED), was assumed to be of psychogenic origin, and even urologists had little interest in its treatment. F. Brantley Scott, a urologist from the Baylor College of Medicine; William E. Bradley, a neurologist; and Gerald W. Timm, a biomedical engineer (both from the University of Minnesota) collaborated to develop an artificial urinary sphincter and an inflatable penile prosthesis. Together with a businessman, Robert Buuck, Drs. Scott, Bradley, and Timm formed American Medical Systems (AMS) to manufacture and market these devices.

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The first inflatable penile prosthesis, made from Dacron-reinforced silicone elastomer, consisted of four parts: an inflation pump, a deflation pump, paired nondistensible cylinders, and a rectangular fluid reservoir. In their initial report, they described its use in five patients (1). This first inflatable penile prosthesis, used from February 1973 to August 1974, was implanted in 12 patients with success in 9 (2).

The first prosthesis to reach the market in 1974 was a modification of this original four-piece device. It had the following design changes: the Dacron reinforcement was eliminated and a single inflation-deflation pump was developed. The reservoir was round, flat, and had a peripheral seam. The cylinders were changed to expandable, single-ply silicone elastomer tubes. Two subsequent modifications to this device were later introduced: a seamless, spherical reservoir in 1978 and rear-tip extenders in 1980. This prosthesis remained in use from 1974 to 1983, and its availability rapidly sparked urologists’ interest in ED.

Furlow reported on 63 men implanted with this prosthesis who had follow-up ranging from 6 to 24 mo. Seventeen (27%) experienced mechanical failures in this relatively short period of time (3). Later, he updated his series with reports on 175 implant recipients followed for 6 to 42 mo. Mechanical failures occurred in 37 (21%) (4). Scott et al. reported on 245 men implanted with this device between 1973 and 1977. The implant procedure was successful in 234 cases (96%) and 102 of these patients (44%) subsequently underwent repeat operation because of surgical complications, mechanical failures, or patient request for a new model (5). Malloy et al. reported on implants in 93 men followed from 6 mo to 4 yr. Complications leading to 31 secondary procedures occurred in 27 (29%) of the patients (6). Fallon et al. reported on 95 men implanted with these devices between 1977–1983. Of these, 48% had been revised, removed, or failed during follow-up (7). We reported on 121 implant recipients. The first 70 patients implanted through a lower abdominal incision, had a total of 63 revisions in 34 patients. The next 51 implants, through a penoscrotal incision, using rear-tip extenders had revisions in only 4 patients (8).

**THE AMS 700 INFLATABLE PENILE PROSTHESIS**

A new model of the inflatable penile prosthesis, the AMS 700 Inflatable Penile Prosthesis, was introduced in 1983. It included the following design changes: kink-resistant tubing, thicker cylinders with redesigned front and rear tips, polytetrafluoroethylene sleeves over the tubing to prevent cylinder wear, and a redesigned pump to permit easier deflation. A sutureless connector system was introduced in 1985. This model remained in use from 1983 to 1987.