

The Artificial Bowel Sphincter Implant Technique (Video)

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Abstract

INTRODUCTION :

For patients with severe, intractable fecal incontinence, the surgical options are limited. One of the new options is the implantation of the artificial bowel sphincter, a silicon elastomer device. This device consists of three components: a cuff, a control pump with septum, and a pressure-regulating balloon, attached to each other with kink resistant tubing. This video shows the steps of implantation.

POSITION OF THE PATIENT :

Before surgery, the patient undergoes a standard mechanical and antibiotic bowel preparation. In the OR the patient is placed in the lithotomy position with the pelvic floor a little bit elevated to get good access to the anogenital area. Extensive cleaning is necessary before and during the operation as infection is still the most frequent complication.

PERINEAL TRANSVERSE INCISION :

In principle there are 2 options to gain access to the upper segment of the anal canal and the distal rectum. Either by bilateral vertical paraanal incisions or by a transverse perineal incision. We prefer the latter due to the fact, that minimizing the incision length may help diminishing the complication rate. It is of tremendous importance to dissect as high up as possible. Then a tunnel around the anal canal through the ischiorectal fossae is formed bluntly.

MEASURING OF THE ANAL CANAL TO DETERMINE CUFF SIZE :

The cuff size is available in widths of 2cm and 2,9 cm and lengths of 9 cm to 14 cm in 1 cm intervals. The most difficult part is to determine the appropriate size. Special cuff-sizers are available to avoid damage to the cuff itself before the actual implantation. At the beginning there is always a tendency toward a too small cuff resulting in rectal wall necrosis.

FLUID FILLING OF THE DEVICE :

In a separate stand, the components are filled with the appropriate filling solution. A radioopaque filling solution is preferred for postoperative control X-ray control of position and function of the device. The steps of filling require care and precision. For example, overdilatation of the occlusive cuff will result in permanent damage to the cuff. If water bubbles are left in the system guarantee for proper function of the device cannot be given. Furthermore one has to keep in mind that silicone components actively attract dust and lint. Therefore cloth drapes which attract lint should be avoided and all surgical gloves must be rinsed free of powder.

CUFF PLACEMENT :

The occlusive cuff is implanted around the anal canal, and when inflated, it occludes the canal by applying pressure circumferentially around the canal. The placement should be prior to filling this part of the device.

BALLOON PLACEMENT IN THE SUPRAPUBIC SPACE :

The pressure regulating balloon controls the amount of pressure exerted by the occlusive cuff. Balloons are available in three different pressure ranges : 81 – 90 , 91-100 and 101 – 111 cm H₂O. The implantation is done in the suprapubic (prevesical) space. After skin incision the rectus fascia is divided . Then the linea alba is separated bluntly, and a pocket is created in the prevesical space of sufficient size to accommodate the pressure regulating balloon. Placement of the balloon and the cuff (both on the same side) is dependant on the patient's dominant hand (right-handed persons prefer to secure the device for activation in the left hand and to squeeze the pump with their right hand)

TUNNELING FOR THE TUBES :

Once the components are in place, tunneling for the tubings

are made . The ABS prosthesis has color coded tubing to help the surgeon create the correct tubing connections.

PUMP PLACEMENT :

The control pump is implanted in the soft tissue of the scrotum or labium and has a standard size of approximately 1.2 cm wide and 3.6 cm long. To implant the control pump in the scrotum or labium blunt dissection with the help of Hegar dilators is done. When t he control pump is then placed in the pocket care must be given that the deactivation button faces anteriorly and is palpable.

SKIN CLOSURE :

Before the skin is closed, the activated device will be checked for proper function. Afterwards the device will be deactivated by the surgeon. It will remain deactivated postoperatively till healing time is completed (usually 6-8 weeks).

RESULTS :

In selected patients the results are good (Table 1).Infection was the most common cause for explantation. Christiansen (6) published recently long-term results (more than 5 year). Out of 17 patients, there were 2 deaths unrelated to the ABS, 3 explantations were due to infection, 4 due to malfunction. Eight patients had a perfect sphincter function and were very satisfied with their result. However, often more than one operation (correction operation) was necessary. Altomare and Lehur confirmed that after successful implantation of the ABS life quality improved significantly (7, 8).

Figure 1

Table 1 : Results of ABS Implantation

Author	Year	N	Complication Infection	Explantation	Success %
Christiansen (1)	1992	12	4 (2 infections)	2	5 excellent, 3 good
Lehur (2)	1996	14	3	3	9 64
Wong (3)	1996	12	4 (33%)	3	9 75
Spencer (4)	1998	13	3	3	9 (1 n. a.) 69
O'Brian (5)	2000	13	3 (2 late)	3	9 +1(leak) 69

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