The plug method in inguinal hernia: a prospective evaluation

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Summary: The aim of this prospective study was to evaluate the results of the Perfix plug® in inguinal hernia. A series of 228 consecutive patients operated on for 242 hernias was prospectively evaluated. The operation was performed under local anesthesia in 154 cases (63.6%), spinal anesthesia in 84 cases (34.7%) and general in 4 cases (1.7%). A plug was used in 202 cases (83.5%) for some type I and II hernias in young people, or for large hernias with a wide deficiency of the posterior wall. Thirteen (5.4%) benign postoperative complications occurred, one plug was removed for sepsis. The mean duration (days, (SD, extremes)) of analgesics consumption, postoperative hospital stay, cessation of normal activities and time off work were 3 (4.07, 0-60), 1.2 (0.89, 0-11), 4.7 (4.45, 0-51) and 16.4 (10.0-60) respectively. The mean follow-up was 22.3 months (SD: 9.93, extremes: 12-48). Only one patient was lost to follow-up. There was one recurrence in the plug series (0.5%) and 2 in other procedures (5%) (ns). Seventeen patients (8.6%) felt some degree of pain in the groin, but not one had to be reoperated on. In conclusion the plug technique provides uneventful postoperative outcome with early recovery and a low recurrence rate, but in some cases some degree of secondary pain may be present.

Key words: Inguinal hernia - Tension-free hernioplasty - Mesh plug - Complications - Recurrences

The cylindrical plug was first introduced in 1968 and reported in 1974 by Lichtenstein [1974] for the repair of femoral hernias and recurrent inguinal hernias. The umbrella plug was introduced by Gilbert in 1987 and published in 1992 [Gilbert 1992], but in this procedure the cone shape was used only to facilitate the placement of the mesh, which was supposed to unfold in the preperitoneal space. The Perfix plug® (Bard Corporate, Murray Hill, NJ, USA), conceived later by Rutkow and Robbins [1993] is different from the former, since it is designed to hold definitely its cone shape. According to these authors the plug contributes to minimize postoperative pain, disability and recurrences, because of the limited dissection and absence of approximating sutures under tension. However they did not give precise data concerning evaluation of postoperative outcome and follow-up. The aim of this prospective study was to verify by a precise evaluation if these objectives are really achieved in current practice.
Material and methods

All consecutive patients who were referred to one of us for inguinal hernia from July 1994 to June 1997 were included in a prospective study, with the aim of applying the plug technique in most cases and opting for another procedure only when the plug did not really seem suitable. A total of 228 patients (221 males and 17 females) of median age 56 years (extremes: 16-93) were operated on for 242 hernias. Sixty seven patients (29.4%) had one or many unfavorable conditions (Table 1). The type of hernias, according to Nyhus classification [Nyhus 1991] is given in Table 2.

Operative technique

The operation was performed under local anesthesia in 154 cases (63.6%), spinal anesthesia in 84 cases (34.7%) and general in 4 cases (1.7%). The mesh used was the Perfix® plug. The operative technique was consistent with the method described by Rutkow and Robbins [1993], with some minor modifications as described in another article [Pélissier 1998]. In indirect hernias the sac was dissected but not resected. The plug was introduced in the deep orifice and fixed by 2 or 3 stitches of non absorbable material. The onlay mesh was applied without any fixation. In direct hernias the fascia was incised around the hernial sac, the hernia was reduced in the preperitoneal space, the plug was introduced in this space and fixed by many separate stitches. When the fascia was very thin and weak, the onlay mesh was fixed to the posterior wall of the inguinal canal by some separate stitches. In some cases where the hernial orifice, either direct or indirect was wide, the plug was ejected when the patient was asked to strain or cough. In these cases a double plug was made by joining together two plugs by the means of three stitches. Conversely, when the orifice was rather small, some petals of the plug were trimmed as advised by Robbins and Rutkow [1998]. When the plug did not seem well suited to the anatomical disorders, another procedure was used: Rives technique, Lichtenstein technique, Shouldice or simple resection of the sac.

Method of evaluation

Short term evaluation was carried out prospectively for analgesics consumption, postoperative complications, hospital stay, time off work and return to normal activities. The latter being defined mainly by driving, or house-keeping and shopping.

In July 1998 a questionnaire was sent to all the patients. Those who did not answer were contacted by telephone. When the questionnaire was returned by the postal services, because the patient had moved, a research was done in the computerized telephone directory. Finally the patients were considered as lost to follow-up, only when they were not found by this way.

Results

The plug technique was used in 202 cases (83.5%) and another technique was used in 40 cases (16.5%). The procedures applied, according to the type of hernias are given in Table 2. Five postoperative complications related to spinal anesthesia occurred (6%): 4 cases of headache and one neuralgia which required analgesics for 2 months. Thirteen surgical complications occurred (5.4%). Details are given in Table 3. One plug was removed for sepsis (0.5%). One hemiplegia occurred 20 days after surgery, the patient being at home. There were no deaths. The mean duration (days, (SD, extremes)) of analgesics consumption, postoperative hospital stay, cessation of normal activities, and time off work were 3 (4.07, 0-60), 1.2 (0.89, 0-11), 4.7 (4.45, 0-51) and 16.4 (10, 0-60) respectively. The mean follow-up was 22.2 months (SD: 9.93, extremes: 12-48); 158 hernias were assessed by answering the questionnaire (65.3%), in 50 cases where patients did not answer they were contacted by telephone (20.7%), 30 hernia repairs were examined by the surgeon (12.4%), 3 patients were dead (1.2%) and only one was lost to follow-up (0.4%). Overall 238 hernia repairs were followed up: 198 plugs and 40 other procedures.

One recurrence occurred in the plug series (0.5%) and two in other techniques series (5%). The recurrence which occurred after a plug technique was entirely asymptomatic and discovered by the surgeon at examination as a simple bulging when coughing. The patient was not reoperated on. The two other recurrences had a hernial sac, were symptomatic and were reoperated on (one by us and one by another surgeon). One testicular atrophy occurred in a multirecurrent hernia. Two patients had some degree of hypoesthesia. Finally 17 patients pointed out some degree of pain in the groin (8.6%). All of them had been operated on by the plug method, including the man for whom the plug was removed for sepsis. The pain occurred at effort in 2 cases, with some movements (mainly bending the thigh) in 5 cases and without relation to any movement in 10 cases. The pain was not severe and removal of the plug was never necessary.

Discussion

Our results confirm that the plug technique facilitates early recovery and gives a low rate of recurrences, but also point out the possible occurrence of secondary pain. Although our series included only a limited number of hernia repairs it gets its validity from the accuracy of evaluation and follow-up.