

# Reproductive outcome after autocrosslinked hyaluronic acid gel application in infertile patients who underwent laparoscopic myomectomy

Autocrosslinked hyaluronic acid gel is useful for preventing postsurgical adhesion formation in infertile patients who have undergone laparoscopic myomectomy, and it increases the pregnancy rate more than laparoscopic myomectomy alone. Moreover, pregnancy rate is significantly higher with the use of subserous sutures. (*Fertil Steril*® 2005;83:498–500. ©2005 by American Society for Reproductive Medicine.)

Uterine fibroids are a very challenging problem for women who want to have children. For patients with unexplained infertility, myomectomy should be performed with conservative surgery and laparoscopically (1).

An important concern regarding laparoscopic myomectomy is postoperative adhesion formation and the development of infertility (2). Autocrosslinked hyaluronic acid gel is a promising resorbable agent barrier for the reduction of postoperative adhesions (3).

The aim of this study was to assess the pregnancy rate after laparoscopic myomectomy in patients treated with autocrosslinked hyaluronic acid gel compared with untreated women and the role of type of suture as a factor influencing the reproductive outcome.

From June 2001 to March 2002, 36 infertile women with symptomatic uterine fibroids were enrolled (3, 4). Patients met the following criteria: history of infertility lasting >3 years or recurrent abortions; main myoma with a diameter of <10 cm but >3 cm; presence of no more than four myomas; absence of submucosal fibroids; absence of hyperplasia with cytologic atypia in the endometrial biopsy; absence of abnormal Papanicolaou smear; and negative urine pregnancy test. Patients with tubal, ovulatory, or male infertility factor were excluded (3).

Patients were preoperatively allocated to one of two groups of 18 women each (groups A and B). At the end of laparoscopic myomectomy, patients in group A received application of autocrosslinked hyaluronic acid gel on the injured uterine surface.

The study was approved by the institutional review board of the University of Naples “Federico II” (Naples, Italy), and written informed consent was obtained from each patient.

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Laparoscopic myomectomy, already described (3, 4), was performed with a 10-mm scope (Karl Storz, Tuttlingen, Germany) with two or three ancillary ports. The fibroid was enucleated with adequate traction with a myoma drill or a strong grasper and counter-traction maneuvers with Manhes forceps, scissors, or hydrodissection instruments.

In each group, the patients were alternatively treated with Vicryl CT 2-0 (Ethicon, Pratica di Mare, Rome, Italy) polyglactin interrupted figure-eight sutures or subserous sutures. Subserous sutures were done with a first deep uterine crossing and a second subserous transfixion with the subsequent knot. Interrupted figure-eight sutures were traditional deep sutures. At the end of surgery, in group A, autocrosslinked hyaluronic acid gel (Hyalobarrier gel; Baxter, Deerfield, IL) was easily applied to the injured areas. Group B was the control group.

Postsurgical adhesions were evaluated 60–90 days after laparoscopic myomectomy by traditional laparoscopy or minilaparoscopy. The minilaparoscopy technique has been described previously (3).

Patients who did not conceive after 6 months underwent ovulation induction (5) from the 7th to the 12th follow-up month. Pregnancy and delivery rates were reported.

Statistical significance of between-group comparisons was assessed by  $\chi^2$  test for proportions. The Student *t*-test for unpaired data was used for comparison between groups, when appropriate. The log-rank test was used to calculate cumulative pregnancy rates. In all analyses, statistical significance was assessed at the 5% level.

There were no significant differences between the two groups for characteristics of patients. Adhesion rates were significantly higher in group A compared with group B and were significantly higher in patients treated with interrupted figure-eight sutures compared with subserous sutures (3).

All patients were followed for 12 months to assess reproductive outcomes. In this period, 4 of 10 patients in

TABLE 1

Pregnancy rates at 6 and 12 months after laparoscopic myomectomy in patients treated (group A) or untreated (group B) with autocrosslinked hyaluronic acid gel.

	Group A (n = 18)			Group B (n = 18)		
	Figure-eight sutures (n = 9)	Subserous sutures (n = 9)	Total patients (n = 18)	Figure-eight sutures (n = 9)	Subserous sutures (n = 9)	Total patients (n = 18)
6 mo	2 (22.2%)	6 (66.7%) <sup>a</sup>	8 (44.4%)	1 (11.1%)	3 (33.3%) <sup>b</sup>	4 (22.2%) <sup>c</sup>
12 mo	5 (55.5%)	9 (100%) <sup>d</sup>	14 (77.8%)	2 (22.2%)	5 (55.5%) <sup>e</sup>	7 (38.8%) <sup>f</sup>

<sup>a</sup> $P < .001$  vs. figure-eight sutures in group A at 6 mo.

<sup>b</sup> $P < .01$  vs. figure-eight sutures in group B at 6 mo.

<sup>c</sup> $P < .01$  vs. group A at 6 mo.

<sup>d</sup> $P < .001$  vs. figure-eight sutures in group A at 12 mo.

<sup>e</sup> $P < .01$  vs. figure-eight sutures in group B at 12 mo.

<sup>f</sup> $P < .01$  vs. group A at 12 mo.

Pellicano. Myomectomy and hyaluronic gel: pregnancy rate. *Fertil Steril* 2005.

group A and 5 of 14 in group B underwent controlled ovarian hyperstimulation with a technique already described (5).

The pregnancy rate was significantly higher in group A than in the untreated group and in patients treated with subserous sutures compared with interrupted figure-eight sutures (Table 1).

No dehiscence of uterine scar was observed, and no differences between groups were observed regarding the delivery route.

Pregnancy rates after laparoscopic myomectomy are comparable to those after laparotomic myomectomy (6, 7). However, in a previous study multivariate analysis showed that patients undergoing laparoscopic procedures have a higher probability of conceiving, possibly owing to a reduced occurrence of postoperative adhesions (8).

In our recent study, we proved that autocrosslinked hyaluronic acid gel is able to reduce postoperative adhesions after laparoscopic myomectomy (3). Previous studies (9, 10) showed pregnancy rates after laparoscopic myomectomy ranging from 33.3% to 64% within 1 year. We report that the occurrence of a pregnancy was higher in the group treated with hyaluronic acid gel (77.8%) than in the untreated group (38.8%) at 12 months. This rate is similar to that reported with the use of an oxidized regenerated cellulose adhesion barrier (78.3%) (11) and higher than that from a study in which the investigators performed adhesiolysis during second-look laparoscopy (66.7%) (12).

We found that subserous sutures are associated with a significantly lower adhesion rate (3) and a higher occurrence of pregnancy, and no differences were noted regarding the location of the main myoma in terms of adhesion

formation (3) and reproductive outcome. Our results were discordant with those of some studies (13, 14).

Laparoscopic myomectomy was been associated with uterine rupture during pregnancy (15) in 1% of cases (16). Excessive use of electrocautery impairs surgical wound healing. No dehiscence of uterine scar was observed in our study.

In conclusion, we consider autocrosslinked hyaluronic acid gel useful for preventing postsurgical adhesion formation in infertile patients who have undergone laparoscopic myomectomy because it increase the pregnancy rate more than laparoscopic myomectomy alone (9, 10). The type of suture influences the reproductive outcome and probably the occurrence of uterine dehiscence.

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