Surgical treatment of ovarian dermoid cysts: a comparison between laparoscopic and vaginal removal

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Abstract

Background: In the last years transvaginal ultrasonographic diagnosis of ovarian dermoid cyst together with laparoscopic approach have greatly improved the treatment of this benign lesion. Vaginal approach with laparoscopic assistance has been proposed as an alternative to total laparoscopic removal. *Method*: A retrospective comparison between total laparoscopic (56 patients) and direct vaginal removal (30 patients) of ovarian dermoids. *Results*: There were few, but significant, advantages of vaginal removal, especially regarding operating time, intraperitoneal spillage of dermoid tissue and post-operative outcome. *Conclusion*: Vaginal approach to the removal of dermoid cysts can be considered a safe alternative procedure to laparoscopy.
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1. Introduction

Dermoid cyst is one of the most common benign ovarian lesions in reproductive age [1]. In the last years, transvaginal scan has dramatically improved the accuracy of ultrasonographic diagnosis, minimising errors and allowing proper counselling and treatment. The ultrasonographic appearance of a typical dermoid cyst relies in fact on peculiar pathognomonic characteristic systematically described by different authors [2–5].

Together with these diagnostic achievements, laparoscopy has dramatically changed the surgical treatment of benign ovarian lesions. In the recent years, laparoscopy has become the most popular surgical approach for the removal of ovarian dermoid cysts: the minimal surgical trauma of laparoscopy has great advantages over laparotomy, concerning post-operative course and full recovery [6–8].

Laparoscopically assisted vaginal operation and removal has been proposed as an alternative to the total laparoscopic operation for the treatment of benign ovarian lesions and in particular for dermoid cysts [9–11]. The authors underlined the advantages of an open field surgery comparing to laparoscopic procedure. The technical feasibility of direct transvaginal operation without laparoscopic assistance was suggested and proven in presence of mobile adnexa, a good access of vaginal vault and a low site of the mass [12,13]. The direct vaginal operation could be faster and easier than laparoscopic operation, if the pre-operative (Table 1) criteria were met.

The objective of this study was to compare intra- and post-operative results between total laparoscopic and direct vaginal removal of ovarian dermoid cysts.

2. Materials and methods

This retrospective study was performed in 96 consecutive patients, who underwent laparoscopic or vaginal removal of ovarian dermoid cysts, in the Department of Gynecological Surgery of DMCO San Paolo, University of Milan, between 1995 and 2000.

During these years, the surgical approach (laparoscopic or vaginal) was based on the experience and training of the surgeon in charge, and, in case of the vaginal approach, on the presence of the criteria for a safe vaginal approach (no

Table 1
Pre-operative characteristics of patients

	LPS ($N = 56$)	VAG ($N = 40$)	P
Age (years)	32.4 ± 9.1 (18–55)	30.4 ± 6.4 (18–47)	0.21
Diameter (mm)	65.2 ± 25.8 (14–150)	57.7 ± 16.2 (40–120)	0.09
Bilaterality (n)	2 (7)	4 (25)	0.22
Nulliparae (n)	28 (50)	16 (40)	0.44

Values are given as mean ± standard deviation (range in brackets) or number (percentages in brackets). LPS: laparoscopic procedure; VAG: vaginal procedure.

other suspected lesions at ultrasound, mobility of the adnexa and good vaginal access). Ovariectomy or cystectomy was chosen according to the presence of normal residual ovarian tissue, age and dimension of the neoplasm. Patients requiring unexpected additional surgical procedures for conditions such as pelvic adhesions or endometriosis were excluded.

All patients had a pre-operative scan within 48 h before surgery. An ultrasound unit with duplex operative modes and a 5–6.5 MHz transvaginal micro convex probe was used. An inhomogeneous mass with irregular hypoechoic and hyperecoic areas with posterior shadowing not separated by septa, or a homogeneous hyperechoic mass with regular capsule and posterior shadowing was categorised as a typical cystic teratoma [14].

Laparoscopic cystectomy or adnexectomy was performed following the traditional laparoscopic surgical criteria avoiding as much as possible the intraperitoneal rupture of the cysts and removing the cysts from the abdominal cavity by means of endobag. If the rupture occurred, very careful lavage of peritoneal cavity was performed.

Vaginal removal was carried out with the patients in general anaesthesia, in lithotomic position. The abnormal ovary was exteriorised through a posterior colpoceliotomy using a Duval or Allis forceps. A needle aspiration of the larger cysts was performed to reduce the volume and permit the exteriorisation through the colpoceliotomy, avoiding the intraperitoneal rupture and spillage. Cystectomy or adnexectomy was then performed as in laparotomic procedures. In case of cystectomy, the remaining ovarian tissue was sutured. After the replacement of the operated ovary in the abdominal cavity, the colpoceliotomy was sutured.

2.1. Statistical analysis

Age, parity, dimension of the lesion, bilaterality of the lesion were compared in the two groups.

Patients included in the two groups were stratified for age (younger or older than 31 years), parity (nulliparae versus pluriparae), and the largest sonographic diameter of the lesion (smaller or greater than 5 cm). A multiple variables analysis was performed on these three criteria of stratification. Outcome measurements in the laparoscopic and vaginal group (mean operating time, blood loss, cystectomy versus adnexectomy, intraperitoneal spillage, post-operative febrile morbidity and post-operative recovery) were compared in the

subgroups identified by the variables independently and significantly associated with different outcomes.

3. Results

In the 5 years considered, 96 patients met the criteria of inclusion. Fifty-six patients (58%) were operated by laparoscopy and forty (42%) by vaginal approach. Age, parity, dimension and bilaterality of the neoplasms were not significantly different in the two groups. Parity, and not age or dimension of the neoplasms, was the only variable significantly and independently associated with different outcomes ($F = 4.72$ with d.f. = 1.72; $P = 0.03$). Therefore, the subsequent comparison between the different outcomes observed in these two groups was stratified for parity. We considered parity as vaginal deliveries or not.

Tables 2 and 3 show the intra- and post-operative results of laparoscopic and vaginal procedures stratified on parity. In nulliparae, cases with intraperitoneal spillage were significantly lower (0.05) and post-operative stay was shorter (0.02) in vaginal procedures. In pluriparae, in the group of patients treated by vaginal surgery, the duration of procedure

Table 2
Intra- and post-operative outcome in nulliparae

	LPS ($N = 28$)	VAG ($N = 16$)	P
Operating time (min)	86.9 ± 41.7 (30–180)	76.8 ± 38.8 (20–160)	0.45
Intra-operative blood loss >100 cc	1 (3)	1 (6)	0.7
Intraperitoneal spillage (n)	8 (28)	0	0.05
Cystectomy (n)	23 (82)	14 (87)	0.96
Febrile morbidity[a] (n)	0	1 (6)	0.77
Post-operative hospital stay (days)	2.5 ± 1 (1–5)	1.9 ± 0.6 (1–3)	0.02

Values are given as mean ± standard deviation (range in brackets), or as number of cases (percentages in brackets). LPS: laparoscopic procedure; VAG: vaginal procedure.

[a] Fever was defined as a temperature greater than 38 °C on two consecutive measurements 24 h after surgery.

Table 3
Intra- and post-operative outcome in pluriparae

	LPS ($N = 28$)	VAG ($N = 24$)	P
Operating time (min)	76.9 ± 30.5 (20–135)	53 ± 16.2 (40–100)	0.003
Intra-operative blood loss >100 cc	2 (7)	1 (4)	0.89
Intraperitoneal spillage (n)	6 (21)	1 (4)	0.15
Cystectomy (n)	13 (46)	19 (79)	0.03
Febrile morbidity[a] (n)	0	1 (4)	0.93
Post-operative hospital stay (days)	2.2 ± 0.6 (1–3)	1.9 ± 0.6 (1–3)	0.19

Values are given as mean ± standard deviation (range in brackets) or as number of cases (percentages in brackets). LPS: laparoscopic procedure; VAG: vaginal procedure.

[a] Fever was defined as a temperature greater than 38 °C on two consecutive measurements 24 h after surgery.

Table 4
Operating time: laparoscopic versus vaginal approach for the same surgical procedure

	LPS (N = 56)		VAG (N = 40)		P
	Operating time	N (%)	Operating time	N (%)	
Cystectomy	80.3 ± 36.4 (20–180)	36 (64)	81.3 ± 33 (40–180)	33 (83)	0.91
Adnexectomy	85 ± 38.9 (40–180)	20 (36)	69.1 ± 32.4 (45–130)	7 (17)	0.35

Values are given as mean ± standard deviation (range in brackets) or as number of cases (percentages in brackets). LPS: laparoscopic procedure; VAG: vaginal procedure.

was significantly shorter (0.003), and the percentage of cystectomies was significantly higher (0.03). Post-operative stay was shorter in vaginal procedure although not significantly.

No major complications were reported in both groups. None of the cases, both in laparoscopic and in vaginal group, required to be converted to laparotomy.

Considering the highest percentage of cystectomy in the laparoscopic group in comparison with vaginal cystectomy, and considering that cystectomy takes more time and may be more difficult, we evaluated the operating time in relation to the different surgical procedures, adnexectomy or cystectomy. No significant differences were reported (Table 4).

4. Discussion

Laparoscopy is the most frequent surgical approach for the treatment of dermoids cysts. However, it bears some disadvantages as well: longer operating time, more expensive equipment, and increased risk of intraperitoneal rupture, especially in case of very large masses. In our reported experience where videolaparoscopy had been used to assist vaginal removal of dermoids [10], we observed a shorter operating time, mainly due to the fact that ovarian cystectomy was easier in open surgery compared to videolaparoscopy. The present study was undertaken hypothesising that a direct vaginal approach without laparoscopic assistance could be chosen as an alternative to laparoscopy in presence of a dermoid cyst with a pathognomonic sonographic morphology and when the ovarian mass is enough mobile to be reached by a posterior colpoceliotomy.

The different surgical skill and training of surgeons in such a long period of time suggested us not to randomise patients to laparoscopic or vaginal treatment, but to define the entry criteria in the study, leave the choice of treatment to the single surgeon in charge and then, retrospectively, analyse the outcome of the two groups. The two groups were not significantly different as far as conditions, which can influence the outcome of these surgical approaches, are concerned: age, parity, dimensions and bilaterality were equally represented in both groups. Moreover the exclusion from the study of the patients, which underwent unexpected additional laparoscopic procedures, permitted us to compare laparoscopic cystectomy or adnexectomy and

vaginal cistectomy or adnexectomy, both in case of monolateral and bilateral dermoid cysts.

In this study were included only patients with a pathognomonic ultrasonographic imaging of dermoid cysts and the histological findings always confirmed the pre-operative diagnosis. Outcome measurements, i.e. duration of surgical procedure, blood loss, spillage, prevalence of cystectomy, post-operative fever, post-operative hospital stay, were separately analysed in nulliparae and in pluriparae, since parity resulted to be a variable significantly and independently associated to different outcomes. Moreover, since vaginal surgery is generally considered more feasible in multiparae rather than in nullipare, we tested the hypothesis that parity could be a criteria of stratification of results. In fact, in a multiple variable regression parity proved to be the only variable independently and significantly associated with different outcome.

In fact, it is considered more correct to compare the results according to parity. In nulliparae, intraperitoneal rupture of the cysts never occurred in the vaginal group and post-operative stay was significantly shorter in vaginal procedure underlining the very minimal surgical trauma of vaginal operations, which could be performed also in outpatients conditions. In pluriparae, in addition to a lower although not significantly different cases of spillage, operation time resulted to be significantly shorter in vaginal procedures compared to laparoscopy.

Although the implications of intraperitoneal spillage of dermoid cyst are controversial, the standard practice is to avoid the spillage of the cystic content. Spillage can be as high as 80% of laparoscopic procedure and 10% of laparotomic [8]. In our experience, spillage occurred in 25% of laparoscopic and in 2.5% of vaginal procedures. The time used for accurate irrigation lavage is likely to be associated with a sparing in operating time in vaginal surgery.

The higher rate of cystectomy could have determined the significantly shorter operating time in vaginal pluriparae group.

One theoretical disadvantage of colpoceliotomic removal of adnexal masses is the risk of pelvic infections. In our series we had only two episodes of febrile morbidity in vaginal procedures using a standard antibiotic prophylaxis, without a significant differences with the laparoscopic approach.

Both laparoscopic and vaginal removal proved safe in skilled hands: no minor or major complications were

recorded both intra- and post-operatively. Conversion to laparotomy never occurred in this series.

We conclude that vaginal approach to the removal of dermoid cysts can be considered a safe alternative procedure, described by Heaney more than a century ago, with some advantages over laparoscopy: shorter operating time and faster recovery.

Acknowledgements

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