
Research Article,

Women's Preference for Cosmesis of Incisions Used for Open Versus Robotic Lower Urinary Tract Reconstructive Surgery

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Abstract:

Objective: To compare the cosmetic appeal of incisions used for open (Pfannenstiel or Vertical midline) versus robotic-assisted laparoscopic lower urinary tract reconstructive surgery in women.

Study design: Cross-sectional descriptive study

Place and duration: Outpatient Urology Clinic of Western General Hospital, Edinburgh Scotland, UK from 1st February 2019 till 28th February 2020.

Methods: All patients were provided illustrations of Pfannenstiel incision (incision at "bikini line"- (A), Vertical midline laparotomy incision (incision from midline symphysis to umbilicus -(B), Robotic-assisted laparoscopic incisions-variation I- (C) and Robotic-assisted laparoscopic incisions-variation II (-D). Patients were asked to rate each incision in order of their preference. Chi square distribution was used to compare mean previous surgeries and no previous surgeries between different preferred incisional groups and ages of the patients.

Results: One hundred patients with mean age were 53.11±15.05 years with minimum 19 years and maximum 84 years and mean BMI was 28.18±7.05 kg/m² with minimum 15.6 and maximum 55 kg/m² calculated. Out of 100 patients (1st preference of incision), 78% preferred incision A, 3% preferred B incision and 16% & 3% patients preferred incision C and D respectively. Similarly (2nd preference of incision) 3% patients preferred incision A, 19% preferred B incision and 56% & 22% patients preferred incision C and D respectively. The mean comparison between first preferred incision with second preferred incision with respect of surgeries (previous surgeries and no previous surgeries) showed significant difference $p \leq 0.05$ (chi value=167.692, $p=0.000$). Relation of preferred incisions with respect to ages of the patients showed no significant difference (Pearson relation value -0.182 and $p=0.069$).

Conclusion: Overall, open incisions were preferred over robotic incisions. Patient perception of the "visibility" of abdominal incisions and previous experience in term of surgical scars may be the distinguishing issue to explain the difference in the preferences between open versus robotic-assisted laparoscopic incisions in women.

Keywords: Cosmetic, Incision, Urinary tract, Reconstructive surgical procedures, Pfannenstiel incision, Vertical midline incision, Robotic assisted laparoscopic incisions,

Introduction:

The landscape of urological surgery has been dramatically altered with Robotic-assisted laparoscopic surgery and many procedures like Robotic-assisted laparoscopic prostatectomy (RALP) has now become the mainstream surgical procedure with proven benefits especially in terms of post-operative pain and blood loss as compared to an open approach^[1]. In complex lower urinary

tract procedures, a growing interest has been reported in literature in using robotic technology like ureteric reimplantation and so on^[2]. In contrast to robotic-assisted laparoscopic surgery which usually requires small multiple incisions in highly visible abdominal areas the minimally invasive "keyhole" robotic-assisted approach has been assumed to have favorable cosmetic outcomes for the patients^[3,4].

The last two decades have witnessed a tremendous shift from open surgery to laparoscopy and now robotic surgery as the surgical approach of choice in all specialties of surgery [5,6]. Complicated surgical procedures have been facilitated amicably due to technical advances in instrumentation and gadgets. Now the increasing attention has been concentrated in reducing the size and number of incisions, with an ultimate goal towards cosmesis and quality of life post-operatively. For example, the single-incision laparoscopy or Laparoscopic single-site surgery (LESS), has been completed successfully by one small incision in contrary to traditionally multiple incisions [7,8]. In this regards the better cosmetic results are reported as an advantage of laparoscopic and robotic surgery as compared to open procedures.

While planning a surgical procedure other than counselling, several readily available sources to provide basic information are used like pamphlets, brochures and online resources. In spite of these efforts, an insufficient data is available in literature which demonstrate the patients' perceptions or understanding of these indications, advantages, disadvantages for their use [9]. Moreover, for most of the surgeons, the process or way of disseminating information in a comprehensible way is also presents a major barrier. While multiple factors are expected to influence the patient's level or degree of understanding (e.g., education level, previous surgical experience etc), only few studies to date has been reported which are addressing the patients' perceptions and the factors which might influence their understanding about various surgical approaches [10].

The one of the factors in success of a surgical procedure depends upon the careful incision site selection and proper wound closure. In this regard multiple factors needs to be considered before making an incision like the pathology, body habitus, exposure required, simplicity of procedure, previous scars, cosmesis etc. among all these the adequate exposure is most important factor which avoids majority of complications during surgery. In addition, the site of incision is also particularly important [11].

In females the abdominal wall cosmesis and functional outcomes is very important. During counselling multiple factors needs to be considered when discussing possible surgical procedure with a surgical candidate to decide

which option is best. From surgeon's perspective, one should consider the patients suitability for particular surgical approach, expected operative time, technical difficulty anticipated during operation, likelihood of complications, cosmesis and patient's satisfaction with outcome. Whereas, the surgeon's skill, postoperative recovery time, post-operative pain, and cosmetic appearance of scars are the important factors [8,12,13].

Insofar as cosmesis, is important to both patient and surgeon. So, it's very important to assess whether patient preferences coincide with the intuitive notion that the surgical procedures with fewer or smaller incisions are preferred more as for as cosmesis is concerned. In addition, while considering cosmetic outcome of incisions or scar from a particular approach or surgical modality during pre-surgical counseling, how much weight should it be given? [6].

There is limited information in literature about the measurable differences in wound and scar appearance between open surgery, conventional laparoscopy and those from robotic assisted laparoscopy. Technical differences between the two approaches vary and can include trocar size, the number of incisions, incision placement and the force generated on the patient's skin [14]. Keeping in view these factors, this study was conducted with an objective to compare the cosmetic appeal of incisions used for open (Pfannenstiel or Vertical midline) versus robotic-assisted laparoscopic lower urinary tract reconstructive surgery in women.

Methodology:

This descriptive cross-sectional study was conducted at Outpatient Urology Clinic of Western General Hospital, Edinburgh Scotland, UK from 1st February 2019 till 28th February 2020. Women were selected consecutively from the outpatient's lists for specified days who were scheduled for clinic visits on voluntary basis. No compensation was offered to the subjects for their study participation. The purpose and method of study was explained to the selected participants. The approval of study was sought from the Institutional Review Board at Western General Hospital, Edinburgh. Inclusion criteria comprises of patients visiting the clinic for a scheduled visit, willing to participate in study pertaining to the appearance of surgical incisions, aged more than 18 years, able to give legally effective consent and for whom lower urinary tract

reconstructive surgery would likely be discussed as a treatment option during their visit. Patients visiting the clinic for a reason other than an annual visit, unwilling patients or who are legally unable to give consent were excluded from study. The main risk to participants is the inconvenience of completing the survey forms.

A questionnaire along with incision illustrations and details was distributed to the willing participants which comprises of demographic details like age, height, weight, marital status, occupation; and history of previous abdominal surgical procedures. These patients were provided with the illustrations (Fig. 1) of 4 different abdominal incisions (labeled A–D) used for lower urinary tract reconstruction. The first incision is of Pfannenstiel incision (14 cm incision at “bikini line”- (incision- A), Vertical midline laparotomy incision (14 cm incision from midline symphysis to umbilicus –(incision -B), Robotic-assisted laparoscopic incisions-variation I- (multi-port laparoscopy with lateral port placement in the lower abdomen ie two 0.5-cm lateral incisions in the lower abdomen and a 1-cm incision hidden in

the umbilical fold - incision- C) and Robotic-assisted laparoscopic incisions-variation II (multiport laparoscopy with lateral port placement in the mid abdomen ie two 0.5-cm lateral incisions in the mid-abdomen and a 1-cm incision hidden in the umbilical fold - incision -D). The relative sizes of the incisions were portrayed to scale. It is important to note that the 2 laparoscopic configurations could also represent robotic cosmetic results.

Patients were asked to rate each incision in order of their preference on a 10-cm visual analog scale (VAS). All 4 incisions were ranked and rated on the same VAS line. The 10-cm marks represented the most desirable incision on the basis of cosmetic appeal alone and 1-cm as the least desirable.

Data analysis: Chi square distribution was used to compare mean previous surgeries and no previous surgeries between different preferred incisional groups and ages of the patients. Values for p were obtained using t tests to analyze differences in means of continuous variables.

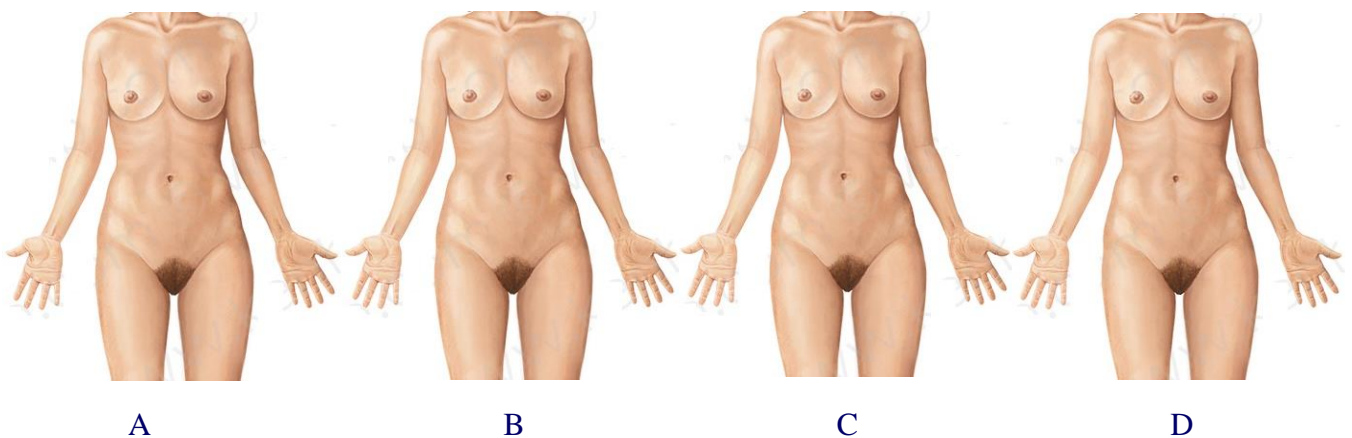


Figure - 1:

- A:** Incision A (Pfannenstiel open incision) Place a vertical mark on the line below to rate the cosmetic appeal of Incision A.
- B:** Incision B (Vertical midline open incision) Place a vertical mark on the line below to rate the cosmetic appeal of Incision B.
- C:** Incision C (Robotic-assisted laparoscopy incision) Place a vertical mark on the line below to rate the cosmetic appeal of Incision C.
- D:** Incision D (Robotic-assisted laparoscopy incision) Place a vertical mark on the line below to rate the cosmetic appeal of Incision D.

Horrible cosmetic appearance



Results:

A total of 100 patients were interviewed which provided the rankings for the illustrated incisions. The mean age was 53.11±15.05 years with minimum 19 years and maximum 84 years and mean BMI was 28.18±7.05 kg/m² with minimum 15.6 and maximum 55 kg/m² calculated. Majority of patients were from 6th decade (n=34, 34%), followed by 7th decade (n=17, 17%) and only one (1%) was from 2nd decade of life (Table-I).

Table I: Frequency of different age groups (N=100)

Age groups	n	%
< 20	1	1%
21 – 30	12	12%
31 – 40	9	9%
41 – 50	15	15%
51 – 60	34	34%
61 – 70	17	17%
71 -80	8	8%
>80	4	4%
	100	100

Out of 100 patients (1st preference of incision), 78% preferred incision A, followed by incision C (n=16, 16%) and 3% (n=3) patients preferred incision B and D each. Among 2nd preference, the incision C was the commonest (n=56, 56%) followed by incision D (n=22, 22%) whereas only

3% (n=3) has given incision A the 2nd preference (Table-II). The mean comparison between first preferred incision with second preferred incision with respect of surgeries (previous surgeries and no previous surgeries) showed significant difference p≤0.05 (chi value=167.692, p=0.000). Relation of preferred incisions with respect to ages of the patients showed no significant difference (Pearson relation value -0.182 and p=0.069).

Table – II: Frequency of preferences for incisions (N=100)

Incisions	1 st preference	2 nd preference
A	78 (78%)	3 (3%)
B	3 (3%)	19 (19%)
C	16 (16%)	56 (56%)
D	3 (3%)	22 (22%)
Total	100	100

Among patients 73% (n=73) had previous surgery whereas only 27% (n=27) were having surgery first time. Among patients with previous surgery 78.08% (n=57) gave 1st preference to incision A and 46.57% (n=34) gave 2nd preference to incision C. similarly the incision A was the commonest choice (77.78%, n=21) followed by incision C (70.37%, n=19) as 2nd choice in patients who have no surgery in past (Table III).

Table – III: Frequency of incision preferences with previous surgery or not (N=100)

Incisions	No previous surgery/scar (n=27)		Previous surgery/ scar (n=73)	
	1 st preference	2 nd preference	1 st preference	2 nd preference
A	21 (77.78%)	0	57 (78.08%)	3 (4.11%)
B	1 (3.70%)	1(3.70%)	2 (2.74%)	23 (31.51%)
C	4 (14.82%)	19 (70.37%)	12 (16.44%)	34 (46.57%)
D	1(3.70%)	7 (25.93%)	2 (2.74%)	13 (17.81%)
Total	27 (27%)		73 (73%)	

Among correlation of work status with scar selection, the incision A was the first choice among house wife (n=23, 95.83%), Retired (n=22, 75.87%), working (n=31, 75.60%) and students (n=2, 50%). In contrary, the incision B and C was the equally first choice in no working females. The incision C is the 2nd commonest among house wife (n=16, 66.66%), retired (n=14, 48.27%) and working females (n=22, 53.66%). The incision D was the 2nd choice in all non-working ladies. (Table- IV).

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Table – IV: Frequency of incision preferences as per work status (N=100)

Status	Incision preference	A	B	C	D
House wife (n=24)	I	23 (95.83%)	-	1 (4.17%)	-
	II	-	4 (17.17%)	16 (66.66%)	4 (17.17%)
Retired (n=29)	I	22 (75.87%)	1 (3.45%)	6 (20.68%)	-
	II	3 (10.35%)	6 (20.69%)	14 (48.27%)	6 (20.69%)
Working (n=41)	I	31 (75.60%)	1 (2.45%)	7 (17.08%)	2 (4.87%)
	II	-	10 (24.39%)	22 (53.66%)	9 (21.95%)
Students (n=4)	I	2 (50%)	-	2 (50%)	-
	II	-	-	2 (50%)	2 (50%)
Not working (n=2)	I	-	1 (50%)	1 (50%)	-
	II	-	-	-	2 (100%)

Discussion:

Surgical incision citing is one of the integral parts in surgical treatment planning of a patients. Patients are equally concerned about cosmesis and surgical outcome as well. Concern about cosmesis may vary from patient's age, working status or with previous surgical experience. The patient perception of the "visibility" of abdominal incisions may be the distinguishing issue to explain the difference in the preferences between different types of incisions as reported in literature [5,6,8]. Patient's education and level of knowledge is another important factor in deciding about surgical procedure out come and cosmesis [7,13]. In this regards the Irani et al [15] has observed that a substantial percentage of patients did not understand the difference between various surgical approaches. They recommend that the health care providers should not assume that their patients have an adequate understanding of their surgical options and accordingly should educate them about those options so they can make truly

informed decisions. Therefore, along with the outcome of surgical procedure, the incision aesthetics are also an important consideration for majority of ladies. So, at the time of informed-consent, the length and location of incisions should be included in the discussion of risks, benefits, and alternatives [13,16,17].

In our study almost all groups of patients except non-working group have preferred incision at "bikini line"- (incision- A) as first priority followed by Robotic-assisted laparoscopic incisions-variation I- (incision- C). Majority of our patients were having mean age of 53.11±15.05 years, mean BMI of 28.18±7.05 kg/m² and from decade of life (34%). The Pfannenstiel incision was most preferred incision (Bikini line) in 78% of our patients as for as cosmetic appearance is concerned. The Yeung Jr and colleagues [6] in their study, asked the patients to rate the importance of 4 factors in their decision making: size, location, and number of incisions, and perceived recovery time. Overall, the Pfannenstiel

incision was the most preferred incision (53%), which is equally popular in all strata and none of the demographic factors has any influence on this choice. During counselling session, the Bush et al [18] has observed that the female prefers both single-site and traditional laparoscopic incisions over the robotic procedures. Similarly, the Goebel and colleagues [19] has reported that the patients strongly preferred the appearance of mini laparotomy and single-port incisions over full Pfannenstiel or robotic incisions. The literature review shows that the same observation was made in different studies from different centers [7,9,16,17,20].

The robotic surgery incisions are less popular as reported in literature [3,10,14,21]. Our study also shows that the Robotic-assisted laparoscopic incisions-variation II in which multiport laparoscopy with lateral port placement in the mid abdomen and another incision in the umbilical fold is least popular (only 3%) among our patients. Bush et al [18] noticed preference for traditional laparoscopic incisions was 56.4%, for single incision (41.1%) and only 2.5% for robotic surgery. In another study by Noor et al [12], has concluded that based on cosmesis alone, most of their patients (70%) preferred laparoscopic surgery as compared to open (23%) whereas only 7% opted for robotic approach ($P < 0.0001$). Based on cosmetic appearance, the patients prefer the laparoscopic approach for abdominal sacro-colpopexy whereas the complication rates and surgeon experience with the procedure are other significant factors observed in the patient's decision making.

Mueller et al [14] has also reported the outcomes of laparoscopic surgery incision esthetic is superior to those after robotic surgery incisions by using objective measures of wound appearance, which surgeons may consider discussing with patients when planning a surgery. When several minimally invasive surgical approaches are possible, the patient should be counseled regarding the cosmetic results of each. Patients in this study strongly preferred the appearance of mini laparotomy and single-port incisions over full Pfannenstiel or robotic incisions [8,19,22].

Laparoscopic surgery is gaining interest and this can be for any number of reasons [4,9,10,21]. Many see a natural progression to reduce the size of incision as compared to open surgery. Although neither truly scar-less nor as pain-free as NOTES,

it may still offer several benefits. Laparoscopic surgery has got the potential to improve cosmesis [9,21]. As with any new surgical technique, there's a learning curve. We now have learned in the problems encountered with surgery is that lacking the appropriate instrumentation and adjusting to a different setup can be hugely challenging and theoretically you will find major differences in technique. Actually, some "rules" of laparoscopy have to be "broken" in order to perform safe procedure. When related to inadequate training and experience, these challenges may increase risk of intraoperative injury. Visualization may be obscured because of crowding of instruments, and longer distance from insertion to operative site presents additional challenges [13,21,22]. To some degree, we still lack optimal instrumentation to overcome issues of working in deep pelvic area. Given these challenges, is laparoscopic surgery worth performing for improved cosmesis? Maybe the hope of slightly faster recovery and decreased pain likely?

Before we are able to answer these questions, there needs to be randomized, prospective studies to compare open to laparoscopy. The theoretical benefits are obvious, but it's unclear whether the benefits really exist and when they'll outweigh the potential risks.

Conclusion:

Overall, open incisions were preferred over robotic incisions. Patient perception of the "visibility" of abdominal incisions and previous experience in term of surgical scars may be the distinguishing issue to explain the difference in the preferences between open versus robotic-assisted laparoscopic incisions in women.

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