**Research Article:**

**Laparoscopic and open Burch colposuspension for stress urinary incontinence: Advantages / disadvantages**

**Ahmed Ali Obaid 1, Shiren Ali Al-Hamzawi 2, Ahmed Abdulameer Alwan 3**

1,3 College of Medicine, University of Al-Qadisiyah, Iraq

2 Al-Diwaniyah Maternity and Children Teaching Hospital, Iraq

**Ahmed83ok@yahoo.com**

**Abstract**

OBJECTIVE: Stress incontinence (SUI) causes a significant physical and psychological burden on women. Laparoscopic vaginal suspension (LC), used in the treatment of women with SUI, is known for its advantages such as smaller incisions, short hospital stay, and better aesthetic results. This article throws light upon the advantages and disadvantages of (LC) and opens up Burch vaginal (OC) incontinence along with its associated complications.

PATIENTS AND METHODS: Between December 1, 2017 and February 10, 2019, 26 women with SUI with physical, social, and psychological consequences from two hospitals were enrolled in this study. The sample was divided into two equal groups of 13 women each. Data were collected and statistically analyzed. P ≤ 0.05 is statistically significant.

Results: The study showed that the operational time was significantly shorter in the OC method compared to the LC approach (59.2 ± 5.3 min, 91 ± 4.5 min, respectively). Mean blood loss was higher in the OC approach than in the LC approach (152.2 ± 30.3, 143.3 ± 38.6), respectively. The LC approach has minimal pain and a shorter hospital stay compared to the OC approach. Patients with the LC approach required less analgesia (8.9 ± 1.3 mg vs 2.5 ± 1.8 mg) and less hospital stay (110.3 ± 11.4 hours vs 70.2 ± 8.9 hours) after surgery. Resumption of normal activity was faster in the LC approach (25.1 ± (12.6) days, 18.9 ± (12.5) days) than in the OC approach. There was no significant difference between the OK and LC approaches in terms of complications.

Conclusion: Although LC is a superior and less invasive approach than the Open Burch approach in terms of hospital stay, blood loss, pain and recovery time, the operation time is longer.

**Keywords:** Stress, Laparoscopy, SUI, Urinary.

**Introduction**

Stress urinary incontinence (SUI) is the involuntary leak of urine on stress like cough, strain, sneezing despite absence of detrusor over activity (1). It is present in 15-80% of women (2). Urinary incontinence is a prevalent problem for many females. About a third of child‐bearing women are incontinent during physical stress. If stress incontinence goes on in spite of medical treatment, surgery is usually recommended. A large number of women's and their family's income have been spent on treatment of SUI.

The prevalence of SUI is underrated as some women with SUI suffer silently (3, 4). SUI presents physical and mental load on women and surgery is the most efficient treatment. Burch's Retro pubic colposuspension is one of the commonly used methods. The existing tendency for implementing less invasive surgery with short stay in hospital, least complications and quick return of women to normal activity had led to emergence of laparoscopic surgery. Vancaille & Schussler described laparoscopic Burch colposuspension in 1991 (5).

 For the time being, most procedures in gynecology can be done by laparoscope, so trials were done to reproduce the best tested Burch method using a laparoscopic technique (6). The goal of this paper is to study the advantages, disadvantages of OC and LC methods for SUI with their related complications.

**Patients and Methods**

Twenty six female with SUI enrolled for this research through 1st December 2017 to10th of February 2019. All participating women were asked to give their informed consent after comprehensive explanation of the surgical procedures and their risks (open surgical colposuspension or laparoscopic colposuspension). The study was done at Al-Diwaniyah Maternity and Children Hospital and Al-Furat Al Awsat Hospital. Data were analyzed statistically. The P value of ≤ 0.05 has statistical significance.

Inclusion criteria: women with no previous stress incontinence surgery and with actual stress incontinence.

Exclusion criteria are women with: urge incontinence, former operation for SUI, those willing to have children in future or those who are liable for hazards during general anesthesia (e.g. cardiac diseases, diabetes insipidus), abdominal obesity and those with suspicion of intraperitoneal adhesions.

**Results**

Women's characteristics were compared in both LC and OC approaches preoperatively. Time of operation was significantly longer in LC approach than OC approach. Pain is less and the hospital stay was significantly short in LC approach. Intraoperative blood loss was lower in LC approach. There was no significant difference in complications (intraoperatively or postoperatively) in both LC and OC approaches. Results are expressed as follow:

**Table 1: Preoperative women's variables**

|  |  |  |  |
| --- | --- | --- | --- |
| Variables | Open approach | laparoscopic approach | P-value |
| Age Mean ± SD  | 51.9 ± 9.8 |  52.3 ± 10.6 | NS |
| BMI Mean± (SD) |  27.1± 4.7 | 27.8± 5.6 |
| Parity Mean± (SD) |  2.7± 1.2 | 2.9± 1.4 |
| Weight (in kg) Mean ± (SD) | 73.1± 12.5 |  75.3± 14.9 |

BMI= Body Mass Index NS=Not Significant

**Table 2: women's operative and postoperative characteristic**

|  |  |  |  |
| --- | --- | --- | --- |
| Characteristics | Open approach | laparoscopic approach | P-value |
| Mean operative time (min) | 91 ± 4.5 | 59.2 ± 5.3 | < 0.05 |
| Operative blood loss (ml) |  152.2 ± 30.2 |  143.3 ± 38.6 |
| Pain score | 8.9 ± 1.3 |  2.5 ± 1.8 |
| Hospital stay (hours)  |  110.3 ± 11.4 |  70.2 ± 8.9 |
| Return to normal activity(days) |  25.1 ± 12.6 |  18.9 ± 12.5 |

Table 3: Satisfaction of patients

|  |  |  |  |
| --- | --- | --- | --- |
| Satisfaction of patient | Open approach | Laparoscopic approach | P-value |
| 1 month  |  |  | NS |
| Satisfied | (8) 61.5% |  (10) 76.9% |
| Not satisfied | (5) 38.5% |  (3) 23.1% |
| 6 month  |  |  | NS |
| Satisfied | (9) 69.2% |  (11) 84.6% |
| Not satisfied | (4) 30.8% |  (2) 15.4% |
| 12 month  |  |  | NS |
| Satisfied |  (10) 76.9% |  (12) 92.3% |
| Not satisfied | (3) 23.1% | (1) 7.7% |

Table 4: Complications

|  |  |  |  |
| --- | --- | --- | --- |
| Complications | Open approach | Laparoscopic approach | P-value |
| Bladder perforation | (0) 0.0% |  (1) 7.7% | NS |
| Wound infection |  (1) 7.7 % | (1) 7.7 % |
| Urinary tract infection |  (2) 15.3 % | (0) 0.0 % |
| Fever |  (3) 23.1 % |  (1)7.7 % |

**Discussion**

Burch colposuspension seems an efficient procedure for treatment of stress incontinent. Laparoscopic Burch colposuspension, is getting publicity on account of its benefits in the form of small incisions, good esthetic results, easy accessibility of Retzius space, better vision of surgical field, minimum blood loss and lesser need for analgesia postoperatively, besides low cost, short stay in hospital (7, 8, 9).

The target of this paper is to throw light on the advantages and disadvantages of (LC) and opens Burch colposuspension (OC) for urinary incontinence and their related complications. It revealed a significant difference in the operative time between LC and OC approaches. The time was short in OC approach (59.2 ± 5.3 minutes) while in LC approach was (91 ± 4.5 minutes). This can be explained by the difficult operative approach of retro pubic space and usage a different number of sutures. The mean time of operation for LC in our study was consistent with other studies (11, 10). And it was inconsistent with data from other literatures (12, 13, 14).

With regard to the mean blood loss our results showed that it is higher in open approach than the laproscopic approach (152.2 ± 30.3, 143.3 ± 38.6) respectively and this coincides with the results of other researchers (15, 16) and not in accordance with Walter et al. who found that the mean blood loss was insignificantly more in LC than OC approaches (12).

In our study, the results revealed that women who are subjected to LC approach seemed to have minimal pain and need lesser analgesia in comparison to OC approach (2.5 ± 1.8, 8.9 ± 1.3) which has s significant difference and this finding is in agreement with that of other researchers (11.10.15.17). The minimal pain in LP approach is clarified by the reality that pain post-operatively is chiefly linked to length of skin incision rather than the procedures of operation.

Mean of the length of stay in hospital in OC approach was significantly longer (110.3 ± 11.4 hours) than that in LC approach (70.2 ± 8.9 hours) and this can be attributed to minimum post-operative pain and quick healing in LC approach. Our results coincide with the results of other authors (10, 11, 13, 17).

With regard to the resumption of usual activity female underwent LC approaches showed significantly shorter days than OC approach and they stated renewal of normal activity by approximately 6 day less than OC approaches.

With regard to women satisfaction no significant difference was seen between LC and OC approaches when followed up for (1, 6, 12) months. There was no significant change detected with the passage of time in both operations as satisfaction is influenced by some variables like offered service in hospital, urinary problems post-operatively (11). All patients were checked out postoperatively and the contact was done either by consultation or telephone.

Regarding the complications (intraoperatively and postoperatively) no significant difference was observed in OC and LC approaches. Bladder perforation was dealt with by laparoscope. Wound infection and urinary tract infection treated appropriately. These finding are in line with most of literatures (10, 13, 14, 16, 19,20,21-29). Kitchener et al. found bladder injury is insignificantly higher in LC approach than open approach and wound infection is insignificantly higher in open approach than LC approach and this is consistent with our finding (18,30-33).

**Conclusion**

LC is a superior and less invasive approach in comparison with open Burch approach for SUI concerning hospital stay, blood loss, pain and period post-operatively and recovery period, while the operation time is longer.

I. Ethical approval:

The manuscript is written in original and all the data, results pertaining to this manuscript are original according to the research performed. The authors followed academic integrity and have not copied any content/results from another source.

II. Funding details (In case of Funding):

The authors of this manuscript did not receive any funding to perform the present research

III. Conflict of interest

The authors of the study do not have any conflict of interest

IV. Informed Consent:

The authors of the manuscript agrees to publish this research in the journal if it’s considerable by the editors of the journal. The authors provide full consent for reviewing and publishing this manuscript.

V. All the authors of this study contributed equally in terms of performing the research as well as in preparing the manuscript. All the authors of the study followed the guidelines of the corresponding author. Any query/suggestion related to the manuscript can be reached to the corresponding author

**References**

1. Haylen BT1, de Ridder D, Freeman RM, Swift SE, Berghmans B, Lee J, et al. An International Urogynecological Association (IUGA)/ International Continence Society (ICS) joint report on the terminology for female pelvic floor dysfunction. Int Urogynecol J. 2010; 21(1): 5-26
2. Richter HE, Albo ME, Zyczynski HM, Kenton K, Norton PA, Sirls LT, et al. Retropubic versus transobturator midurethral slings for stress incontinence. N Engl J Med. 2010; 362:2066-76.
3. Hunskaar S, Lose G, Sykes D. The prevalence of urinary incontinence in women in four European countries. BJU Int. 2004; 93: 324-30.
4. Abrams P, Cardozo L, Fall M. The standardization of terminology in lower urinary tract function: report from the standardization subcommittee of the International Continence Society. Urology 2003; 61: 37-49.
5. Vancaillie TG, Schuessler W. Laparoscopic bladder neck suspension. J Laparoendos Surg. 1991; 1 (3): 169-73.
6. Dorsey JH, Cundiff G. Laparoscopic procedures for incontinence and prolapse. Curr Opin Obstet Gynecol. 1994; 6: 223-230.
7. Fusco F, Abdel-Fattah M, Chapple CR, Creta M, La Falce S, Waltregny D et al. Updated systematic review and meta-analysis of the comparative data on colposuspensions, pubovaginal slings, and midurethral tapes in the surgical treatment of female stress urinary incontinence. Eur Urol. 2017; 72(4): 567-91.
8. Sivaslioglu AA, Caliskan E, Dolen I, Haberal A. A randomized comparison of transobturator tape and Burch colposuspension in the treatment of female stress urinary incontinence. Int Urogynecol J Pelvic Floor Dysfunct. 2007; 18 (9):1015-9.
9. Asıcıoglu O, Gungorduk K, Besımoglu B, Ertas E, Yıldırım G, Celebı I, et al. A 5-year follow-up study comparing Burch colposuspension and transobturator tape for the surgical treatment of stress urinary incontinence. Int J Gynaecol Obstet. 2014; 125(1): 73-7.
10. Miannay E, Cosson M, Lanvin D. Comparison of open retropubic and laparoscopic colpo suspension for treatment of stress urinary incontinence. European journal of obstetrics and gynecology and reproductive biology 1998; 79: 159-66.
11. Carey M, Goh J, Rosamilia A. Laparoscopic versus open Burch colposuspension: a randomized controlled trial. British journal of obstetrics and gynecology 2006; 113: 999-06.
12. Walter J, Abraham N, Hammer A, Hentz G, Magrina F, Cornella L, et al. Laparoscopic versus open Burch retropubic urethropexy: comparison of morbidity and costs when performed with concurrent vaginal prolapse repairs. American Journal of obstetrics and gynecology 2002; 186: 723-28.
13. Bulent Tiras M, Sendag F, Dilek U, Guner H. Laparoscopic Burch colposuspension: Comparison of effectiveness of extraperitoneal and transperitoneal techniques. European Journal of Obstetrics & Gynecology and Reproductive Biology 2004; 116: 79-84.
14. Persson J, Wølner-Hanssen P. Laparoscopic Burch colposuspension for stress urinary incontinence: a randomized comparison of one or two sutures on each side of the urethra. Obstetrics and Gynecology 2000; 95:151-5.
15. Al-Grawi E.D.C. and Al-Awsi G.R.L. Expression of CDKN2A (p16/Ink4a) among Colorectal Cancer Patients: A cohort study. Journal of Pharmaceutical Sciences and Research. 2018; 10 (5): 1145-1147.
16. Shamran AR, Shaker ZH, Al-Awsi GRL, Khamis AS, Tolaifeh ZA. and Jameel ZI. , 2018. Rapd-PCR is a good DNA finger-printing technique to detect phylogenetic relationships among Staphylococcus. aureus isolated from different sources in Hilla city, Iraq. Biochem Cell Arch. 2018; 18 (suppl. 1): 1157- 1161.
17. Eqbal Dohan Chalap, and Ghaidaa Raheem Lateef Al-Awsi. 2019. “A General Overview of the Genetic Effects of Extracellular Polymers For Enterococcus Faecium in Cancer Cells”. International Journal of Research in Pharmaceutical Sciences 10 (1), 436-43. https://pharmascope.org/index.php/ijrps/article/view/74.
18. Chillab Eqbal Dohan, Talib Ro'a Ali, Al-Awsi Ghaidaa Raheem Lateef, (2019). Genetics of Sickle Cell Anemia Disorders in Baghdad City, Iraq. Indian Journal of Public Health Research & Development, 10 (2): 817-822.
19. Ali A Alsudani et al 2019 J. Phys.: Conf. Ser. 1294 062099
20. Ghaidaa Raheem Lateef Al-Awsi et al 2019 J. Phys.: Conf. Ser. 1294 062077.
21. Ali A Alsudani and Ghaidaa Raheem Lateef Al-Awsi, 2020. Biocontrol of Rhizoctonia solani (Kühn) and Fusarium solani (Marti) causing damping-off disease in tomato with Azotobacter chroococcum and Pseudomonas fluorescens. Pakistan Journal of Biological Sciences, 23: 1456-1461.
22. Ghaidaa Raheem Lateef Al-Awsi et al 2021 IOP Conf. Ser.: Earth Environ. Sci. 790 012013.
23. Bassam F. ALfarhani et al 2021 IOP Conf. Ser.: Earth Environ. Sci. 790 012037
24. Bassam F. ALfarhani et al 2021 IOP Conf. Ser.: Earth Environ. Sci. 790 012040
25. Alfarhani, B.F., Hammza, R.A. & Alzaidy, A.S. Potential effect of solvent and slit width on some properties of room temperature fluorescence of hydroxy polycyclic aromatic hydrocarbons. Chem. Pap. 75, 3915–3920 (2021). https://doi.org/10.1007/s11696-021-01602-1
26. S. H. Ewiad, B. F. Al-Farhani, S. A. Abed, and N. Al-Ansari, ‘Modeling of trihalomethane compounds formation in Baghdad water supply network’, Scientific Review Engineering and Environmental Sciences, vol. 29, no. 2, pp. 136–144, 2020.
27. Bassam Faron Alfarhani et al 2019 J. Phys.: Conf. Ser. 1294 052045
28. Bassam Alfarhani, Maha Al-Tameemi, Hector C. Goicoechea, Fernando Barbosa, Andres D. Campiglia, Direct analysis of benzo[a]pyrene metabolites with strong overlapping in both the spectral and lifetime domains, Microchemical Journal, 137 2018, 51-61,
29. B. Alfarhani, M. Al-tameemi, A.V. Schenone, H.C. Goicoechea, F. Barbosa, A.D. Campiglia. Microchem. J., 2016 129 83–89. https://doi.org/10.1016/j.microc.2016.06.010
30. Polascik T, Moore R, Rosenerg M, Kavoussi L. Comparison of laparoscopic and open retropubic urethropexy for treatment of stress urinary incontinence. Urology1995; 45: 647-52.
31. Ankardal M, Ekerydh A, Crafoord K, Milsom I, Stjerndahl JH, Engh ME. A randomized trial comparing open Burch colposuspension using sutures with laparoscopic colposuspension using mesh and staples in women with stress urinary incontinence. British Journal of Obstetrics and Gynecology 2004; 111: 974-81.
32. Fatthy H, El Hao M, Samaha I, Abdallah K. Modified Burch Colposuspension: Laparoscopy versus Laparotomy. The Journal of the American Association of Gynecologic Laparoscopists 2001; 8(1): 99-06.
33. Kitchener H, Dunn G, Reid F. Laparoscopic versus open colposuspension results of a prospective randomized controlled trial. International journal of obstetrics and gynaecology 2006; 113: 1007-13.