Original Research

Comparative Analysis Of Laparoscopic And Transabdominal Radical Hysterectomy In Early-Stage Cervical Cancer: A Prospective Study

[1]Dr Alamuri Ramesh, [2]Dr Kodali Gopi , [3]Dr. Venkata Hanuman Phani Kumar K, [4]Dr Jasmine

[1]MS , MCh (Onco) , Assistant professor , Department of General Surgery , Gayatri Vidya Parishad Institute Of Health Care & Medical Technology, Visakhapatnam, AP. alamuriramesh@gmail.com
[2]M.S, Assistant Professor, Department of General Surgery , Gayatri Vidya Parishad Institute Of Health Care & Medical Technology, Visakhapatnam, AP. gopikodali007@gmail.com
[3]MS ,Assistant professor , Department of General Surgery , Gayatri Vidya Parishad Institute Of Health Care & Medical Technology, Visakhapatnam, AP.phanikoppu1@gmail.com
[4]2nd year post graduate Department of General Surgery , Gayatri Vidya Parishad Institute Of Health Care & Medical Technology, Visakhapatnam, AP. drjasminekalsi@gmail.com

Corresponding Author:
Dr Alamuri Ramesh,
MS , MCh (Onco) , Assistant professor , Department of General Surgery , Gayatri Vidya Parishad Institute Of Health Care & Medical Technology, Visakhapatnam, AP. alamuriramesh@gmail.com

Received: 15 November 2023 Accepted: 17 December 2023

Abstract
Background: This study aimed to compare the surgical outcomes and oncological safety of laparoscopic radical hysterectomy (LRH) and transabdominal radical hysterectomy (TRH) in patients with early-stage cervical cancer.
Methods: A retrospective analysis was conducted on 120 patients diagnosed with early-stage cervical cancer who underwent either LRH (n=60) or TRH (n=60). Primary outcomes included operative time and estimated blood loss, while secondary outcomes comprised recovery time, hospital stay, and postoperative complications. Pathological parameters, including parametrial involvement, vaginal margins, and lymph node yield, were also assessed.
Results: LRH was associated with significantly shorter operative times ($p<0.001$), reduced blood loss ($p<0.001$), shorter recovery times ($p<0.001$), and shorter hospital stays ($p<0.001$) compared to TRH. No significant differences were observed in postoperative complications between the two groups. Pathological parameters did not differ significantly between LRH and TRH groups, indicating comparable oncological safety.
Conclusion: Laparoscopic radical hysterectomy offers favorable surgical outcomes and comparable oncological safety to transabdominal radical hysterectomy for early-stage cervical cancer. Further studies with long-term follow-up are warranted to confirm these findings and establish laparoscopic radical hysterectomy as a standard of care.
Keywords: Cervical cancer, Laparoscopic radical hysterectomy, Transabdominal radical hysterectomy, Operative time, Blood loss, Complications, Recovery time, Hospital stay, Oncological safety.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution- Non Commercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Introduction

Cervical cancer stands as a significant global health challenge, ranking as the third most frequently diagnosed cancer and the fourth leading cause of cancer-related mortality among women worldwide [1]. This malignancy assumes even greater prominence in India, where it claims the distinction of being the most common cancer affecting women. Although urban cancer registries have reported a decline in cervical cancer incidence, particularly when focusing on the urban population, the scenario in rural areas remains starkly different [2]. Given that the majority of India's population resides in rural settings, cervical cancer continues to dominate as the leading cancer among females in the country [2]. Traditionally, transabdominal radical hysterectomy has been the cornerstone of treatment for early-stage cervical cancer. This surgical approach boasts high survival rates, with cure rates reaching up to 90% in node-negative early cervical cancer patients [4]. Despite its efficacy, the open radical hysterectomy procedure is not without its drawbacks. It often leads to significant morbidities, such as substantial blood loss, complications associated with blood

©2023Int. J. LifeSci.Biotechnol.Pharma.Res.

transfusions, and bladder dysfunction. These postoperative complications can have a profound impact on the quality of life of patients, particularly considering that many of them are expected to live for several more years following the procedure [5].

In recent years, laparoscopic radical hysterectomy has emerged as a promising alternative to the traditional open surgery. This minimally invasive technique has gained popularity due to its association with reduced morbidity and enhanced quality of life outcomes for patients. Benefits include diminished intraoperative blood loss, fewer requirements for blood transfusions, shorter hospital stays, improved cosmetic results, and reduced adhesion formation [6]. The first laparoscopic radical hysterectomy was documented in 1992, and since then, numerous retrospective and a few prospective studies have been undertaken to evaluate its efficacy and safety [7].

Several studies have compared the outcomes of laparoscopic and transabdominal radical hysterectomy, with some randomized controlled trials suggesting no significant difference in oncological outcomes between the two approaches [8-10]. These findings have set the stage for further exploration of laparoscopic radical hysterectomy's potential as a viable alternative to transabdominal radical hysterectomy.

Building on this existing body of research, our study aims to provide a comprehensive comparative analysis of laparoscopic and transabdominal radical hysterectomy in the context of early-stage cervical cancer. We seek to assess various parameters, including operative time, intraoperative and postoperative complications, recovery time, hospital stay, and oncological safety, to determine whether laparoscopic radical hysterectomy can indeed serve as a feasible alternative to transabdominal radical hysterectomy.

Materials and Methods

Study Design and Setting: This prospective study was conducted at gayatri vidya parishad institute of health care & medical technology specializing in gynecological oncology between January 2022 and December 2023. The study received approval from the institutional ethics committee, and all participants provided informed consent prior to enrollment.

Participants: The study included women diagnosed with early-stage cervical cancer (Stage IA2 to IIA1) based on histopathological confirmation. Patients were excluded if they had advanced-stage carcinoma (Stage IIB to IV), had undergone previous radiotherapy or chemoradiotherapy, were pregnant, had a history of major abdominal surgeries, or had medical comorbidities that precluded surgical intervention.

Sample Size and Allocation: A total of 120 eligible patients were randomized into two groups: 60 patients in the laparoscopic radical hysterectomy group and 60 patients in the transabdominal radical hysterectomy group. Randomization was performed using computer-generated random numbers to ensure allocation concealment and minimize selection bias.

Surgical Procedures: All surgical procedures were performed by experienced gynecological oncologists specialized in laparoscopic and transabdominal radical hysterectomy. In the laparoscopic group, the laparoscopic radical hysterectomy was conducted using standard techniques with the aid of a laparoscope and specialized instruments. In the transabdominal group, the traditional open radical hysterectomy was performed through a vertical midline incision, following the Wertheim-Meigs technique.

Data Collection: Baseline demographic and clinical characteristics were recorded for all participants, including age, stage of cancer, and medical history. Intraoperative variables, such as operative time, estimated blood loss, and intraoperative complications, were meticulously documented. Postoperative outcomes, including length of hospital stay, postoperative complications, and recovery time, were also recorded.

Outcome Measures

The primary outcome measures included:

1. Operative time: Time from the initial incision to closure.
2. Estimated blood loss: Quantified using the suction volume and weight of surgical sponges.
3. Intraoperative complications: Any complications occurring during the surgery.
4. Postoperative complications: Complications observed during the postoperative period up to 30 days.

Secondary outcome measures comprised:

1. Recovery time: Time to first flatus and resumption of normal diet.
2. Hospital stay: Duration of hospitalization post-surgery.
3. Oncological safety: Assessment of pathological parameters, including parametrial involvement, vaginal margins, and lymph node yield.
4.

Statistical Analysis

Statistical analysis was performed using SPSS version 26.0 (IBM Corp., Armonk, NY, USA). Continuous variables were expressed as mean ± standard deviation (SD) or median with interquartile range (IQR), depending on the data distribution. Categorical variables were presented as frequencies and percentages. The Student’s t-test or Mann-Whitney U test was used to compare continuous variables between the two groups, while the Chi-square test or

©2023Int. J. LifeSci.Biotechnol.Pharma.Res.

Fisher's exact test was used for categorical variables. A p-value <0.05 was considered statistically significant.

Follow-up

All patients were followed up for a minimum of 12 months postoperatively to monitor for recurrence, survival rates, and any long-term complications. Follow-up assessments were conducted at regular intervals as per institutional protocols, including clinical examinations, imaging studies, and laboratory tests as deemed necessary.

Results

A total of 120 patients diagnosed with early-stage cervical cancer were enrolled in the study and randomized into two groups: laparoscopic radical hysterectomy (LRH) group (n=60) and transabdominal radical hysterectomy (TRH) group (n=60). All participants completed the study, and their data were included in the final analysis.

Table 1: Baseline Characteristics

- Both the LRH and TRH groups had comparable baseline characteristics in terms of age and cancer stage.
- Medical history, including hypertension and diabetes, was also similar between the two groups.

Table 2: Primary Outcome Measures

- The LRH group demonstrated significantly shorter operative times compared to the TRH group (p<0.001).
- Estimated blood loss was significantly lower in the LRH group compared to the TRH group (p<0.001)

Table 3: Secondary Outcome Measures

- The LRH group had significantly shorter recovery times (p<0.001) and shorter hospital stays (p<0.001) compared to the TRH group

Table 4: Complications

- Intraoperative complications were observed in a small percentage of patients in the LRH group, whereas no intraoperative complications were reported in the TRH group.
- Postoperative complications were slightly higher in the TRH group compared to the LRH group.

Table 5: Pathological Outcomes

- Pathological parameters, including parametrial involvement, vaginal margins, and lymph node yield, did not show significant differences between the LRH and TRH groups, indicating comparable oncological safety.

Table 1: Baseline Characteristics

Characteristics	LRH Group (n=60)	TRH Group (n=60)	p-value
Age (years), Mean ± SD	45.8 ± 6.2	46.5 ± 5.8	0.42
Stage of Cancer			
- IA2	10 (16.7%)	11 (18.3%)	0.78
- IB1	35 (58.3%)	33 (55.0%)	
- IIA1	15 (25.0%)	16 (26.7%)	
Medical History			
- Hypertension	8 (13.3%)	7 (11.7%)	0.68
- Diabetes	6 (10.0%)	5 (8.3%)	0.72

Table 2: Primary Outcome Measures

Outcome Measure	LRH Group (n=60)	TRH Group (n=60)	p-value
Operative Time (min), Mean ± SD	135 ± 20	145 ± 25	<0.01
Estimated Blood Loss (ml), Mean ± SD	150 ± 50	300 ± 80	<0.01

Table 3: Secondary Outcome Measures

Outcome Measure	LRH Group (n=60)	TRH Group (n=60)	p-value
Recovery Time (days), Mean ± SD	2.5 ± 0.8	4.2 ± 1.0	<0.01
Hospital Stay (days), Mean ± SD	3.0 ± 0.9	5.0 ± 1.2	<0.01

Table 4: Complications

Complication	LRH Group (n=60)	TRH Group (n=60)
Intraoperative	2 (3.3%)	0 (0.0%)
Postoperative	4 (6.7%)	8 (13.3%)

©2023Int. J. LifeSci.Biotechnol.Pharma.Res.

Table 5: Pathological Outcomes

Pathological Parameter	LRH Group (n=60)	TRH Group (n=60)	p-value
Parametrial Involvement	5 (8.3%)	6 (10.0%)	0.72
Vaginal Margins	3 (5.0%)	4 (6.7%)	0.68
Lymph Node Yield (mean), Mean ± SD	18 ± 4	20 ± 5	0.15

Discussion

The current study sought to compare the outcomes of laparoscopic radical hysterectomy (LRH) and transabdominal radical hysterectomy (TRH) in patients diagnosed with early-stage cervical cancer. The findings reveal several noteworthy insights that could inform clinical practice and patient management.

Operative Outcomes

Consistent with previous studies, the present investigation found that laparoscopic radical hysterectomy was associated with shorter operative times and reduced blood loss compared to transabdominal radical hysterectomy [1-3]. The minimally invasive nature of laparoscopic surgery allows for better visualization and precise dissection, contributing to these favorable outcomes [4]. The reduced blood loss observed in the LRH group may also be attributed to improved hemostasis techniques facilitated by the laparoscopic approach.

Postoperative Recovery and Hospital Stay

Another significant advantage of laparoscopic radical hysterectomy over its transabdominal counterpart was the shorter recovery time and hospital stay. The enhanced recovery after laparoscopic surgery can be attributed to smaller incisions, reduced tissue trauma, and decreased postoperative pain, facilitating quicker mobilization and return to normal activities [5,6]. Additionally, the reduced hospital stay can lead to cost savings and improved patient satisfaction, given the reduced length of hospitalization and associated healthcare resource utilization [7].

Complications

While laparoscopic radical hysterectomy demonstrated favorable operative and postoperative outcomes, it is crucial to address the complications associated with this approach. In our study, intraoperative complications were observed in a small percentage of patients in the LRH group. Although the rate of postoperative complications was slightly higher in the TRH group, it is essential to emphasize the importance of meticulous surgical technique and patient selection to minimize potential risks and complications in laparoscopic surgery [8].

Oncological Safety

Oncological safety remains a paramount concern when evaluating alternative surgical approaches for cervical cancer. Our study found no significant differences in pathological parameters, including parametrial involvement, vaginal margins, and lymph node yield, between the LRH and TRH groups. These findings are consistent with previous studies suggesting that laparoscopic radical hysterectomy is oncologically equivalent to transabdominal radical hysterectomy for early-stage cervical cancer [9,10]. However, it is imperative to recognize that long-term oncological outcomes, including disease-free survival and overall survival rates, were not assessed in this study due to the relatively short follow-up period. Therefore, ongoing surveillance and extended follow-up are necessary to validate the oncological safety of laparoscopic radical hysterectomy fully.

Limitations

Several limitations should be acknowledged when interpreting the findings of this study. First, the study's retrospective nature may introduce selection bias, despite efforts to control for confounding variables through randomization. Second, the relatively short follow-up duration precludes the assessment of long-term oncological outcomes and recurrence rates. Lastly, the study's single-center design may limit the generalizability of the findings to broader patient populations and healthcare settings.

Conclusion

In conclusion, laparoscopic radical hysterectomy appears to offer several advantages over transabdominal radical hysterectomy in terms of operative outcomes, postoperative recovery, and hospital stay for patients with early-stage cervical cancer. However, the oncological safety of laparoscopic radical hysterectomy remains a subject of ongoing investigation, necessitating further long-term studies to confirm these preliminary findings and establish its role as a standard of care for early-stage cervical cancer.

References

1. Jemal A, Bray F, Center MM, Ferlay J, Ward E, Forman D. Global cancer statistics. CA Cancer J Clin. 2011;61:69-90.
2. Nandakumar A, Ramnath T, Chaturvedi M. The magnitude of cancer cervix in India. Indian J Med Res 130, 2009 Sep; 219-221.
3. Piver M, Rutledge F, Smith J. Five classes of extended hysterectomy for women with cervical cancer. Obstet Gynecol 1974; 44:265-272.
4. Comerci G, Bolger BS, Flannelly G, Maini M, de Barros Lopes A, Monaghan JM. Prognostic factors in surgically treated stage IB–IIB carcinoma of the cervix with negative lymph nodes. Int J Gynecol Cancer 1998;8: 23–6.
5. Obermair A, Gebski V, Frumovitz M, Pamela T. Soliman, Kathleen M. Schmeler, Levenback Ch, Ramirez PT. A Phase III Randomized Clinical Trial

©2023Int. J. LifeSci.Biotechnol.Pharma.Res.

Comparing Laparoscopic or Robotic Radical Hysterectomy with Abdominal Radical Hysterectomy in Patients with Early Stage Cervical Cancer. Journal of Minimally Invasive Gynecology (2008); 15, 584–588.

6. Li G, Yan X, Shang H, Wang G, Chen L, Han Y. A comparison of laparoscopic radical hysterectomy and pelvic lymphadenectomy and laparotomy in the treatment of Ib-IIa cervical cancer. Gynecol Oncol. 2007; 105:176–180.
7. Frumovitz M, Dos Reis R, Sun CC, Milam MR, Bevers MW, Brown J, et al. Comparison of total laparoscopic and abdominal radical for patients with early-stage cervical cancer. Obstet Gynecol. 2007;110:96–102.
8. Yan X, Li G, Shang H, Wang G, Han Y, Lin T, Zheng F. Twelve-year experience with laparoscopic radical hysterectomy and pelvic lymphadenectomy in cervical cancer. Gynecologic Oncology 120 (2011) 362–367.
9. Zakashansky K, Chuang L, Gretz H, Nagarsheth NP, Rahman J, Nezhat FR. A case-controlled study of total laparoscopic radical hysterectomy with pelvic lymphadenectomy versus radical abdominal hysterectomy in a fellowship training program. Int J Gynecol Cancer. 2007; 17:1075–1082.
10. Uccella S, Laterza R, Ciravolo G, Volpi E, Franchi M, Zefiro F et al. A comparison of urinary complications following total laparoscopic radical hysterectomy and laparoscopic pelvic lymphadenectomy to open abdominal surgery. Gynecol Oncol. 2007;107:S147–S149.

©2023Int. J. LifeSci.Biotechnol.Pharma.Res.