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ORIGINAL ARTICLE

Comparison of Fagotti's Index and Sugarbaker's Peritoneal Cancer Index (PCI) in Predicting Resectability in Advanced Ovarian Cancer

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ABSTRACT

Background: Peritoneal carcinomatosis is a condition that manifests in advanced stages of ovarian cancer. The primary determinants of total debulking are the disease's volume and distribution. The procedure known as diagnostic Laparoscopy makes it possible to assess the illness. The purpose of this study is to evaluate the diagnostic accuracy of two laparoscopic scores—Fagotti's index and Sugarbaker's peritoneal cancer index (PCI)—to reduce the number of needless laparotomies and identify patients who should get neoadjuvant treatment.

Methods: This prospective cohort study occurred in the Obstetrics and Gynecology Department, Zagazig Gynecology Unit (ZGOU), Faculty of Medicine, Zagazig University, Egypt, on patients with a diagnosis of peritoneal carcinomatosis in advanced ovarian cancer. Fagotti's index and Sugarbaker's peritoneal cancer index were assessed in all cases.

Results: The PCI score achieved a higher area under the curve (AUC) of 0.920, while the Fagotti score had an AUC of 0.823. The PCI score cut-off level for predicting Resectability was (≥ 15), which had a sensitivity of 80% and a specificity of 80%, predictive value for positive (PVP) = (66.7%), predictive value for negative (PVN) = (88.9%), and (80%) accuracy.

Conclusion: Both Sugarbaker's (PCI) and Fagotti 's index are reliable and accurate indices in predicting Resectability in advanced ovarian malignancy, with Sugarbaker's (PCI) being more specific.

Keywords: Fagotti's index, Sugarbaker's peritoneal cancer index, Resectability, advanced ovarian cancer.

INTRODUCTION

With 70–80% of cases discovered in advanced stages, ovarian cancer is the most common cause of mortality from gynecologic cancer **[1, 2].** Since the size of the tumor residue has an inverse effect on overall survival, complete primary debulking surgery is an independent survival factor **[1, 2].** The primary determinants of total debulking are the disease's volume and distribution. Because patients differ at the same stage, the FIGO classification is not a useful tool for determining the extent of the disease **[3].**

The most precise diagnostic technique for figuring out the disease burden is laparotomy. It is an invasive diagnostic technique with drawbacks **[1].** The percentage of less-invasive examination options, such as diagnostic Laparoscopy, lowers suboptimal surgery from 39% to 10% **[2, 4].** In addition to limiting needless morbidity and lowering expenses associated with needless laparotomies, diagnostic Laparoscopy can increase the success rate of surgeries **[5, 6].** The test's accuracy would increase with an assessment technique that permits individuals with peritoneal carcinomatosis to have their condition quantified **[3].**

Scores are an objective way to compare outcomes and decide the recommended course of treatment for each patient; however, this is currently a hurdle **[3].**

By using laparoscopic ratings, patients with little chance of achieving complete cytoreduction may

have fewer needless laparotomies. Interval cytoreductive surgery followed by neoadjuvant chemotherapy is a suitable alternative for these patients **[2].** The most widely used laparoscopic prediction models for assessing the spread of ovarian cancer are the Fagotti score **[7]** and the peritoneal carcinomatosis index, as defined by Sugarbaker.

In the past, European gynecologic oncologists have utilized Fagotti's index to forecast the likelihood of cytoreductive surgery during laparotomy for gynecologic cancers **[8, 9].**

METHODS

This prospective cohort study was conducted on patients with peritoneal carcinomatosis in advanced ovarian cancer at the Obstetrics and Gynecology Department, Zagazig Gyneoncology Unit (ZGOU), Faculty of Medicine, Zagazig University, Egypt. The Institutional Review Board of Zagazig University was consulted regarding study approval (IRB number 10899-25-6-2023). Informed written consent was obtained from every patient.

Inclusion criteria included age of 18 years old or older and diagnosis of peritoneal carcinomatosis in ovarian cancer. Exclusion criteria comprised patients with early-stage ovarian cancer, those who were not suitable for laparoscopic surgery or surgical intervention, those who underwent chemotherapy and visited for periodic debulking, and those who declined to provide consent for data gathering.

Every patient underwent a comprehensive medical history, a full gynecological and general examination, a CBC, liver, and kidney function tests, a coagulation profile, and tumor markers in the laboratory (CA125, CA19.9, CEA, LDH, alpha-fetoprotein, ß hcG).

Surgical Technique

Palmer Point was utilized as the principal point of entrance. Under direct view, a suprapubic 5mm auxiliary trocar was inserted, and when necessary, a second 5mm trocar was added to the iliac fossa. To confirm the diagnosis, a biopsy of the ovaries, metastatic nodules, or peritoneal surface was done in addition to a thorough examination of the entire abdominal cavity. Peritoneal carcinomatosis indices (PCIs) above 20 are thought to be linked to increased morbidity and a lower likelihood of full debulking **[1].** The value considered unresectable in the Fagotti index is equal to or higher than 8 **[10].** Prior to deciding to do surgery for primary debulking, however, the histology of the illness, the patient's performance status, and the subjective assessment of the oncology surgeon were assessed.

Scores

Fagotti Score: [1]

Omental cake, peritoneal carcinomatosis, diaphragmatic carcinomatosis, mesenteric retraction, stomach infiltration, intestine infiltration, and liver metastases are the seven characteristics that make up the Fagotti Score. If a parameter is omitted, its value is 0; if it is present, it is 2. The overall value ranges from 0 to 14. Suboptimal surgical outcomes are associated with a score of 8 or above.

Sugarbaker Score (PCI):

The right hypochondrium(1), left hypochondrium(3), epigastrium(2), left flank(4), left iliac fossa(5), pelvis(6), right iliac fossa(7), and right flank (8) are the nine regions that make up the abdomen. The following four area scores—upper jejunum (9), lower jejunum (10), upper ileum (11), and lower ileum (12)—respond to the digestive tract. If no tumor is visible, each area receives a score of 0; if a tumor is present, it receives a value of 1 if it is between 0.5 and 5 cm and 3 if it is greater than 5 cm or confluent. The resultant value falls between 0 and 39. The bibliography establishes a "cut-off" point of ten to twenty.

After laparoscopic assessment, primary cytoreductive surgery was done to the cases marked as resectable by any of the two indices. Then operative outcomes were evaluated for having optimal cytoreduction or suboptimal cytoreduction. Residual disease after surgery was reported as R0, R1 and R2. R0 was defined as no macroscopic residual disease. R1 and R2 were defined as a macroscopic residual disease with a maximal diameter of < 1 cm and >1cm, respectively. The optimal resection was defined as either Ro or R1. Then, surgical outcomes were compared to the results of both laparoscopic indices.

STATISTICAL ANALYSIS

SPSS 26.0 for Windows was used to gather, tabulate, and statistically analyze the data (SPSS Inc., Chicago, IL, USA). The tests employed were as follows: separate samples Student's Mann Whitney t-test For non-normally distributed data, the U test, Chi-square test, and ROC curve analysis were utilized—coefficient of correlation.

RESULTS

The present study included 30 cases with a mean age of 55.63 years, ranging from 37 to 72 years; the mean BMI of the cases was 30.87, ranging from 24 to 44 years old. About one-third of cases, 30%, were hypertensive, and 13.3% were diabetic. The mean parity among cases was 3.57 times with a median of 3. The mean tumor marker (Ca 125) was 480.9 IU/mL with a median of 427 (194.5-770.25) IQR. Regarding CT findings, in most cases, 83.3%,

showed Ascites. Peritoneal carcinomatosis was found in 43.3% of cases, and two-thirds of cases (63.3%) had Omental disease. In comparison, 33.3% had Lymphadenopathy, and only one case showed either Mesenteric disease or Bowel infiltration. Majority of cases, 93.3% showed Ovarian mass; among them, 40% had bilateral masses, and 53.3% had unilateral masses. No cases showed Diaphragmatic disease, Stomach infiltration, or Liver metastasis. Regarding Laparoscopic findings, two-thirds of cases (60%) had Peritoneal carcinomatosis, Diaphragmatic disease was found in 46.7% of cases, and two-thirds of cases (73.3%) had Omental disease. In comparison, 36.7% of them had Bowel infiltration, about 13.3% of cases had Mesenteric disease, and only one case showed either Stomach infiltration or Liver metastasis (3.3%) (Table 1).

Regarding Laparoscopic findings, table (1S) showed that one-third of cases (66%) had left upper and pelvis Peritoneal carcinomatosis lesions less than 0.5 cm, about (26.6%) of cases had right lower and right flank Peritoneal carcinomatosis between 0.5 cm and 5 cm, about (20%) of cases had right flank Peritoneal carcinomatosis of 5 cm or more.

As illustrated in table (2S) regarding difficulties during Laparoscopy, nearly one-third of cases (23.3%) showed large masses, 13.3% showed Omental mass related to the abdominal wall, and 6.7% had Severe adhesions. No cases showed previous incisions. Regarding laparoscopic data, the mean Operational time was 25.67 minutes, the mean blood loss was 23 with a median of 17.5, and the mean hospital stay was 3.2 days. Only one case needs ICU admission. Regarding pathology, 76.7% of cases, 76.7%, showed high-grade serous carcinoma, while about 23.3% showed low-grade serous carcinoma. Regarding the FIGO classification, third, 66.6% were classified as FIGO IIIc, 13% presented stage Ic, 10% presented stage IV, and 10% presented stage Ic.

The mean of Fagotti's score with the laparoscopic approach was 5.4 with a median of 6 and IQR (of 3.75-8), and the mean PCI score was 12.63 with a median of 12 and IQR (of 5.75-21.25) (Table 2).

Regarding cytoreductive surgery, The average blood loss was 521.43 milliliters, the average operating duration was 155.54 minutes, and the average hospital stay was 5.5 days. Both total hysterectomy and Omentectomy were done in all of the cases. Peritonectomy was done in 90% of cases, half of the cases needed Lymphadenectomy, and Appendectomy was done in about 56.7%. Nearly 66.7% of primary cytoreductive surgery cases had Optimal surgery, while 33.3% had Suboptimal surgery. Regarding pathology, 76.7% of cases, 76.7%, showed high-grade serous carcinoma, while about 23.3% showed low-grade serous carcinoma (Table 3S).

According to the FIGO classification, two-thirds (63.3%) were classified as FIGO IIIc, and 6.7% presented stage IV or stage Ib. Bladder injury was found in only one case, while Bowel, vascular, and Ureteric injuries were absent in all cases (Table 3S).

As shown in Table 3 regarding Resectability, more than half of the cases, 66.7%, had optimal primary cytoreductive surgery. At the same time, 33.3% of masses were sub-optimal primary cytoreductive surgery.

As this table shows, no statistically significant difference was found between ideal respectability and either age or BMI. However, there was a statistically significant difference between each of the tumor marker (Ca 125), PCI, and Fagotti scores and optimal resectability, where Optimal cytoreduction cases showed a lower median value of tumor marker (Ca 125), PCI, and Fagotti score than sub-optimal cytoreduction cases (Table 4).

Regarding Spearman's correlation analysis, a statistically significant positive connection was seen between the PCI CA125 and Fagotti scores (Table 5).

Regarding PCI results, there was a statistically significant difference between the two groups, as the positive cases were 16 in group I, while the negative cases in group II were 8. Regarding the Fagotti score, True positive instances were 15 in Group I, and true negative cases were 9 in Group II, indicating a statistically significant difference between the two groups (Table 6).

The predictive potential of the PCI score and the Fagotti score for Resectability was tested using ROC curve analysis; the PCI score had an area under the curve (AUC) of 0.920, and the Fagotti score had an AUC of 0.823. With a sensitivity of 80%, specificity of 80%, predictive value for positive (PVP) = (66.7%), predictive value for negative (PVN) = (88.9%), and accuracy of 80%, the PCI score cut-off level for the prediction of Resectability was (≥ 15) (Table 7).

The ROC curve analysis was done to evaluate the predictive ability of (PCI score and Fagotti score) for Resectability where the Fagotti score cut-off level for the prediction of Resectability was (≥ 8) which had an accuracy of 80%, a predictive value for positive (PVP) of 93.75%, a predictive value for negative

(PVN) of 64.3%, and a sensitivity of 75% and a specificity of 90% (Table 7).

Table 1: Basic, clinical characteristic and CT findings, Laparoscopic findings of Fagotti of the studied group (n=30)

Characteristic	**Study group (n=30)**			
Age (years)	55.63±10.46 (37-72)			
BMI	30.87±4.8 (24-44)			
Parity	3.57±2.01 3 (2.75-4)			
CA125 tumor marker	480.9±330.77 427 (194.5-770.25)			
Category			**No.**	**%**
Medical condition	DM		4	13.3
	HTN		9	30.0
	No		17	56
CT findings			**No.**	**%**
Peritoneal carcinomatosis	Yes		13	43.3
Diaphragmatic disease	No		0	0
Mesenteric disease	Yes		1	3.3
Omental disease	Yes		19	63.3
Bowel infiltration	Yes		1	3.3
Stomach infiltration	No		0	0
Liver metastasis	No		0	0
Ascites	Yes		25	83.3
Lymphadenopathy	Yes		10	33.3
Ovarian mass	No		2	6.7
	Yes	Bilateral	12	40
		Unilateral	16	53.3
Laparoscopic findings of Fagotti			**No.**	**%**
Peritoneal carcinomatosis	Yes		18	60
Diaphragmatic disease	Yes		14	46.7
Mesenteric disease	Yes		4	13.3
Omental disease	Yes		22	73.3
Bowel infiltration	Yes		11	36.7
Stomach infiltration	Yes		1	3.3
Liver metastasis	Yes		1	3.3

Table 2: Laparoscopic index PCI and Fagotti score (n=30)

Characteristic	**Study group (n=30)**
PCI Mean ±SD Range	 12.63±8.21 12 (5.75-21.25)
Fagotti score Mean ±SD Range	5.4±3.53 6 (3.75-8)

Table 3: Resectability of the studied group (n=30)

Study group (n=30)			
Category		**No.**	**%**
Respectability	Optimal surgery	20	66.7
	Sub Optimal surgery	10	33.3

Table 4: Relation between Respectability and basic characteristics & each of tumor marker CA125, PCI and Fagotti scores the studied group(n=30)

Characteristic	Optimal cytoreduction Group (n=20)	Suboptimal cytoreduction Group (n=10)	Test (t)	P value
Age Median (IQR)	54±10.18	58.9±10.77	-1.219	0.233
BMI Mean ±SD Median (IQR)	31.3±5.36	30±3.49	0.693	0.494
CA125 **Median (IQR)**	226.5 (163.75-674.5)	687 (425.25-887.25)	-2.288	0.022*
PCI score **Mean ±SD** **Median (IQR)**	8.5±5.99 9 (2-13.75)	20.9±5.26 22 (18.75-24.25)	-3.703	<0.001*
Fagotti score **Mean ±SD** **Median (IQR)**	4.05±2.89 4 (0.5-6)	8.1±3.21 8 (5.5-10)	-2.871	0.004*

Table 5: Correlation between tumor markers (PCI & Fagotti) and different parameters

Variables		PCI score	Fagotti score
Fagotti	Correlation Coefficient	**.581****	1.000
	Sig. (2-tailed)	**0.001**	
AGE	Correlation Coefficient	0.129	0.174
	Sig. (2-tailed)	0.495	0.359
BMI	Correlation Coefficient	-0.039	0.108
	Sig. (2-tailed)	0.839	0.568
CA125	Correlation Coefficient	**.367***	0.173
	Sig. (2-tailed)	**0.046**	0.362
Hospital stay(days)	Correlation Coefficient	-0.206	-0.166
	Sig. (2-tailed)	0.462	0.553

Table 6: Values of the PCI score and Fagotti score in resectability prediction between two groups

Items	Cases		P value
	Optimal cytoreduction (n=20)	**Suboptimal cytoreduction (n=10)**	
PCI **Positive** **Negative**	 16 4	 2 8	**<0.001***
Fagotti			**<0.001***

Positive	15	1	
Negative	5	9	

Table 7: Predictive values of the PCI score and Fagotti score in resectability prediction

Variables	AUC	95%CI	Cut-off	Sensitivity	Specificity	PVP	PVN	Accuracy
PCI score	0.920	0.809-1	15	80%	80%	66.7%	88.9%	80%
Fagotti score	0.823	0.650-0.995	8	75%	90%	93.75%	64.3%	80%

AUC=Area under curve, PVP=Predictive value for positive, PVN= Predictive value for Negative, CI= Confidence Interval

DISCUSSION

Advanced ovarian cancer management is challenging and requires a range of treatment approaches, including primary cytoreductive surgery followed by adjuvant chemotherapy or neoadjuvant chemotherapy followed by interval cytoreductive surgery **[11].**

Selecting the best course of action for women diagnosed with ovarian cancer is essential; while total cytoreductive surgery should be accomplished, there should not be a lot of pointless laparotomies performed. Therefore, the crucial step is to choose patients who can have the best possible cytoreductive surgery **[12].**

Over the past few decades, determining a tumor's Resectability has grown in importance as a research topic. Determining the Resectability of a tumor may be best accomplished through laparotomy. However, because to its invasive nature and tendency to postpone chemotherapy, it is not suitable for the majority of patients **[13].**

According to reports, CT scans are among the reliable methods for determining if a tumor can be surgically removed. Gynecologic oncologists frequently utilize this accessible and less invasive diagnostic technique. However, it is less useful due to its low negative predictive value for tumor resectability **[13].**

Laparoscopy as a diagnostic tool for tumor resectability has been studied in women with advanced ovarian cancer. One advantage of Laparoscopy is that it can provide an enhanced abdominopelvic survey, with the possibility of achieving greater anatomy magnification. Many studies have demonstrated that because of its short recovery period and minimal morbidity, it is beneficial for patients with advanced ovarian cancer **[14].**

Vergote et al. [15] first shared their experience treating patients with advanced ovarian cancer with Laparoscopy. Based on laparoscopic findings, the researchers in their study decided whether to proceed with neoadjuvant chemotherapy or primary debulking surgery.

In 2008, Fagotti and colleagues [14] proposed a laparoscopic rating system to help patients with advanced ovarian cancer forecast how well their surgery will go. They suggested that a predictive index score greater than eight had the following characteristics: 100% specificity, 100% positive predictive value, and 70% negative predictive value. It is debatable whether routine Laparoscopy should be used to treat advanced ovarian cancer. In some specialized centers, it is used routinely in every case. However, its use is limited in other centers **[16]**.

Since Sugarbaker first described it in 1998, the peritoneal cancer index (PCI) has become the accepted method for characterizing mesothelioma and carcinomatosis of colorectal cancer**.**

As a result, PCI would be a useful technique for precisely assessing peritoneal spread in AOC **[1].**

Between June 2023 and June 2024, 30 patients with advanced ovarian cancer had their peritoneal cancer index (PCI) and Fagotti's index compared for predicting Resectability. The sensitivity, specificity, negative predictive value (NPV), positive predictive value (PPV), and diagnostic accuracy of the two laparoscopic scores are compared in order to forecast poor cytoreduction in patients with peritoneal carcinomatosis in advanced ovarian cancer.

In this investigation, we discovered that CT performed better when assessing lymph nodes, which were challenging to evaluate with Laparoscopy. When the results of a CT scan were compared to the conclusions reached by laparoscopic evaluation, it became clear that the CT scan is not a reliable way to determine how far along the disease has gone in ovarian cancer.

Similarly, the literature's findings indicate that CT is useful for evaluating nodal metastases. However, models derived from CT examination are not very useful for identifying disease spread or predicting surgical outcomes for patients with ovarian cancer **[17].**

For example, the findings of this study align with the study conducted by **Hynninen and colleagues**, which assessed the data of 41 patients with advanced ovarian cancer. Each patient had a CT scan with contrast, and the results were compared to the surgical findings (during laparoscopic assessment or surgery). The study's findings demonstrated that CT was not very useful for identifying lesions in various abdominal locations. The sensitivity of CT in identifying mesenteric and small bowel lesions was 27%, while it was 55% sensitive in identifying upper abdominal peritoneal metastases **[18]. Tozzi et al. [19]** conducted an evaluation of data from 350 patients with advanced ovarian cancer and found that combining laparoscopic assessment with CT scan information is the most effective way to make a choice. The former cannot serve as a CT substitute due to its limitations in evaluating certain anatomical regions, specifically the lymph nodes and the porta hepatis.

Regarding technical difficulties of laparoscopic assessment, the challenging point is how to introduce pneumoperitoneum safely in such cases. Despite we reported four cases with a palpable mass related to anterior abdominal wall & seven cases with large ovarian mass pneumoperitoneum was introduced safely.

Veress needle placement was done through the palmer point in 30 cases, no cases of intestinal injury during the introduction of pneumoperitoneum in this series

The outcomes align with the findings of **El-Agwany's [20]** study, which revealed that 14 out of 15 patients had laparoscopic evaluation using palmar point entry, with umbilical entry being utilized in one instance because of adhesions at the palmar point.

Over a sizable patient population In a retrospective study published in **2013, Fagotti and associates [21]** assessed the laparoscopic evaluation in 341 cases of advanced ovarian cancer. Thirty (8.8%) of the individuals had abdominal masses that made laparoscopic evaluation extremely challenging. In eleven patients, the mass was penetrating the abdominal wall, making laparoscopic examination impractical. Instead, a laparotomy was performed.

Regarding the issues associated with laparoscopic evaluation, we did not report any cases of port site metastases or problems associated with evaluation. The lack of port site metastases may have been caused by the short follow-up period and the limited number of cases.

This is in line with the findings of **Fagotti and colleagues [21]**, who examined the laparoscopic assessment of advanced ovarian cancer in a group of 300 cases and demonstrated the absence of procedure-related problems. Furthermore, this series did not include any instances of port site metastases. The patient's selection, the trocar site's selection, and the meticulous abdominal palpation that preceded the treatment were all cited by the authors as contributing factors to these excellent outcomes.

Despite reports in the literature of a 1% to 14% incidence of port site metastases, this did not negatively affect the patient's chances of survival. Its management was easy: excision of the site of metastasis. Surgeons using this procedure should not be discouraged by their concern about this complication **[22].**

In this study, the laparoscopic assessment was helpful in these patients as it spared those patients from unnecessary exploration and allowed obtaining tissue biopsy for adequate diagnosis. Given that patients' median hospital stays lasted two days, they were able to start chemotherapy within 2 weeks. So, with minimal operative risks and complications, the patients could start chemotherapy without delay.

In this study regarding histopathology, high-grade serous carcinoma was detected in 23 patients (76.7%), and 20 patients (66.6%) were at stage IIIc. These results are consistent with the results of **Petrillo et al. [23]**, who found 193 of 234 cases (82.5 %) had FIGO Stage IIIc and 203 (86.7 %) patients had serous ovarian cancer.

Regarding the features of the tumor, prior research has shown that histologic subtypes other than high-grade serous carcinoma (HGSC) had worse prognoses than HGSC because of decreased sensitivity and resistance to traditional platinum-based combination treatment **[24].**

Prior to NACT, it was challenging to identify the histological subtype of ovarian cancer. By acquiring tissue for pathological testing, diagnostic Laparoscopy may facilitate the identification of the histological subtype and identify patients who would not benefit from NACT if they have the non-HGSC subtype **[25].**

Preoperative pathology studies that are less invasive, including CT-guided needle biopsies, are increasingly being used to detect histopathologic types. Comparing diagnostic Laparoscopy to these techniques has the advantage of providing histopatholgic data, which aid in determining whether optimal surgery is feasible by examining the distribution of the disease and preventing needless morbid, suboptimal laparotomies**[25].**

Regarding the utility of preoperative predictors of suboptimal cytoreduction, we studied clinical data, radiological data, CA 125, and laparoscopic findings to assess the ability of these data to predict suboptimal cytoreduction.

There was an insignificant difference between optimal respectability and each age and BMI.

In this study, the median level of CA 125 at diagnosis was 687 in the sub-optimal cytoreduction group and 226.5 in the Optimal cytoreduction group. We found significant difference between the two groups and these results agree with the cut-off value suggested in the literature.

Finding a cut-off point that could predict suboptimal cytoreduction was the focus of multiple research that looked at CA125 as a predictor of suboptimal cytoreduction. It has been proposed that a cut-off value of CA 125 > 500 indicates the likelihood of inadequate cytoreduction. These studies' findings are not very reliable and change depending on the centers and surgeons' surgical expertise **[26].**

There was a statistically significant difference between each tumor marker (Ca 125) in this investigation, PCI and Fagotti score, and Resectability where optimally resectable cases showed a lower median value of tumor marker (Ca 125), PCI and Fagotti score than sub-optimally resectable cases. Additionally, it demonstrates that a substantial positive association was discovered between the PCI score and the CA125 and Fagotti scores.

These findings are consistent with **Greggi et al. [7]** study From 2005-2008 on 61 patients, which found a strong correlation between PCI and Fagotti (correlation coefficient, 0.84; P< .0001).

Additionally, the study's findings are in line with**. Llueca et al. [1]**, in their analysis of 110 patients with AOC, revealed a significant correlation between PCI and preoperative CA125 levels ($p < 0.007$).

Ovarian cancer cases were split into two groups according to the initial cytoreductive surgery results. Sixty-seven percent of the cases in the first group had received optimal primary cytoreductive surgery. Cases with suboptimal primary cytoreductive surgery (33.3%) comprised the second group.

Based on the laparoscopic findings by (PCI) in our study, optimal primary cytoreduction was deemed achievable in 16 of 20 patients(80%) who had an optimal primary cytoreduction, while out of 10 patients who had suboptimal primary cytoreduction, 8 patients(80%) were detected by (PCI).

Regarding the laparoscopic findings by (Fagotti's index) in our study, optimal primary cytoreduction was deemed achievable in 15 of 20 patients(75%) with an optimal primary cytoreduction. In comparison, out of 10 patients with sub-optimal primary cytoreduction, 9 patients (90%) were detected by (Fagotti's index).

These outcomes are in line with those of Andikyan and colleagues, who assessed data from 55 patients with ovarian cancer who underwent laparoscopic evaluation. Of these, 49 patients (89%) were determined to be capable of achieving optimal cytoreduction, and 48 of these patients (96.7%) went on to achieve optimal primary cytoreduction **[13].**

These results are in line with a randomized experiment in which 201 patients suspected of having advanced-stage ovarian cancer had their staging laparoscopy before primary cytoreductive surgery evaluated in order to avoid unnecessary laparotomy. By using staging laparoscopy, the percentage of unnecessary laparotomies dropped from 39% to 10% **[27].**

The evidence available from **Zeff [12]** A comprehensive evaluation backs the addition of a second laparoscopic examination to the standard first diagnostic workup for women diagnosed with ovarian cancer. The current NCCN guideline's suggestion is supported by the findings of the systematic review.

This is in comparison with data retrieved from a study conducted by **Fleming et al. [28]**, which showed that laparoscopic assessment allowed for an optimal tumor resection rate of 94% in primary tumor-reductive surgical cases.

The predictive potential of the PCI score and the Fagotti score for Resectability was tested in this study using the ROC curve analysis method. The PCI score attained an area under the curve (AUC) of 0.920, while the Fagotti score had an AUC of 0.823. With a sensitivity of 80%, specificity of 80%, predictive value for positive (PVP) = (66.7%), predictive value for negative (PVN) = (88.9%), and accuracy of 80%, the PCI score cut-off level for the prediction of Resectability was (≥ 15).

The results of this study are consistent with **those of Rawert et al. [29]**, who found that using a cut-off of 17 in PCI was the most sensitive and specific marker for optimal cytoreductive surgery.

The results agree with **Lampe et al. [30]** that the study's ideal cytoreduction demonstrates a moderate to strong connection between PCI and surgical success. The 0.839 AUC of the ROC curve showed how well the PCI predicts the ideal cytoreduction with a high degree of discriminate precision.

The results of this study were different from those of**. Llueca et al. [1]**, demonstrated that an SCS of 38% ($p < 0.01$) was linked to a PCI > 20, while an OCS of 94% was related to a PCI < 10.

The results of this study were different from those of **Lampe et al. [30].** The lower the PCI, the more likely it is to achieve optimal cytoreduction. The likelihood of reaching optimal cytoreduction was 77.7% with a PCI of 5, compared to only 38.6% with a PCI of 15. With a sensitivity of 75%, specificity of 90%, predictive value for positive (PVP) = 93.7%, predictive value for negative (PVN) = 64.3%, and accuracy of 80%, the Fagotti score cut-off level for the prediction of Resectability was (≥ 8).

These results agree with a laparoscopy-based scoring model developed by **Fagotti and colleagues [14]** showed that for predicting a suboptimal primary tumor reductive surgery, a Fagotti's index of ≥8 had a specificity of 100%, positive predictive value of 100%, and negative predictive value of 70%, while a Fagotti's index of ≥6 had a positive predictive value of 90% and a negative predictive value of 71.2%. In this model, 1 cm or less was considered the ideal tumor size for tumor reduction surgery.

Our results agree with **Llueca et al. [31]**; his surgical team created the Fagotti model in response to reports of an OCS rate of 67%, a 69% agreement between Laparoscopy and the outcome of surgery, and a 34% rate of needless laparotomies.

Our findings indicate that the PCI was 80% accurate in predicting the Resectability of advanced ovarian cancer.

These results are consistent with **Lampe et al. [30]**, who demonstrated that the PCI score appears to be relevant to other peritoneal metastasizing malignancies and is already established in general surgery. The description gives equal weight to all pelvic and abdominal regions, which makes it remarkably accurate. It is a helpful addition to the current ovarian cancer classification systems and may be utilized as a criterion for determining Resectability.

At our hospital, laparoscopic scoring assessment has made it possible to handle patients with advanced-stage ovarian cancer in a way that is more individualized. It enhanced appropriate resection rates at primary tumor reductive surgery and led to an objective triage of patients to primary cytoreduction or neoadjuvant chemotherapy.

CONCLUSIONS

In conclusion, individuals with ovarian cancer may benefit from a laparoscopic evaluation to ascertain their chances of attaining an ideal cytoreduction. It is safe and doable, with limited risks and clear advantages. By tailoring the treatment, it may help prevent needless laparotomies and surgical problems. Patients may be correctly and successfully triaged for either neoadjuvant chemotherapy or primary cytoreductive surgery based on a laparoscopic examination. While Sugarbaker's (PCI) is more specific, both Fagotti's and Sugarbaker's (PCI) are valid and accurate indices for determining Resectability in advanced ovarian cancer. It was more difficult to evaluate lymph nodes using Laparoscopy; therefore, the combination of laparoscopic assessment with information from CT scans should be researched and evaluated.

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Table 1S: Laparoscopic findings of PCI within the studied group (n=30)

Study group (n=30)								
Regions		**0**	**%**	1	**%**	**2**	**%**	**3**	**%**
Central		18	60	8	26.6	3	10	1	3.3
Right upper		15	50	8	26.6	4	13.3	3	10
Epigastrium		11	36.6	9	30	7	23.3	3	10
Left upper		13	43.3	10	33.3	5	16.6	2	6.6
Left flank		12	40	7	23.3	7	23.3	4	13.3
Left lower		10	33.3	7	23.3	8	26.6	5	16.6
pelvis		9	30	10	33.3	6	20	5	16.6
Right lower		**10**	**33.3**	**8**	**26.6**	**8**	**26.6**	**4**	**13.3**
Right flank		**8**	**26.6**	**8**	**26.6**	**8**	**26.6**	**6**	**20**
Upper jejunum		**16**	**53.3**	**5**	**16.6**	**7**	**23.3**	**2**	**6.6**
Lower jejunum		**17**	**56.6**	**6**	**20**	**5**	**16.6**	**2**	**6.6**
Upper ileum		**15**	**50**	**7**	**23.3**	**6**	**20**	**2**	**6.6**
Lower ileum		**20**	**66.6**	**5**	**16.6**	**4**	**13.3**	**1**	**3.3**

Table 2S: Difficulties during Laparoscopy and laparoscopic data of the studied group (n=30)

Study group (n=30)			
Category		**No.**	**%**
Previous incisions	No	0	0
Severe adhesions	Yes	2	6.7
Large mass	Yes	7	23.3
Omental mass related to the abdominal wall	Yes	4	13.3
Laparoscopic data			
Operative time (min) Mean ±SD Range	25.67±10.81 (10-50)		
Blood loss(ml) Mean ±SD Median (IQR)	23±15.51 17.5 (10-31.25)		
Hospital stays (days) Mean ±SD Median (IQR)	3.2±1.16 2 (3-5)		

Category			**No.**	**%**
ICU admission	Yes		1	3.3
Pathology	Yes	High-grade serous carcinoma	23	76.7
		Low-grade serous carcinoma	7	23.3
FIGO stage	No		0	0
	Yes	Ib	3	10
		Ic	4	13.3
		It	20	66.6
		IV	3	10

Table 3S: Cytoreductive surgery data of the studied group (n=30)

Characteristic	**Study group (n=30)**			
Operative time (min) Mean ±SD Range	155.54±30.23 (80-195)			
Blood loss(ml) Mean ±SD Range	521.43±117.78 (300-800)			
Hospital stay (days) Mean ±SD Range	5.5±1.3 3-8			
Category			**No.**	**%**
Total hysterectomy	Yes		30	100
Omentectomy	Yes		30	100
Peritonectomy	No		3	10
	Yes		27	90
Lymphadenectomy	No		15	50
	Yes		15	50
Appendectomy	No		13	43.4
	Yes		17	56.7
Optimal surgery	No		8	26.6
	Yes		20	66.7
	Yes		10	33.3
Bowel injury	No		30	100
Vascular injury	No		30	100
Ureteric injury	No		30	100
Bladder injury	No		27	96.7
	Yes		1	3.3
Pathology	High grade serous carcinoma		23	76.7
	Low-grade serous carcinoma		7	23.3
FIGO stage	No		6	20
	Yes	Ib	2	6.7
		Ic	1	3.3
		IIIb	1	3.3
		IIIc	18	60.0
		IV	2	6.7

Figure 1S: Deposits on the liver and stomach.

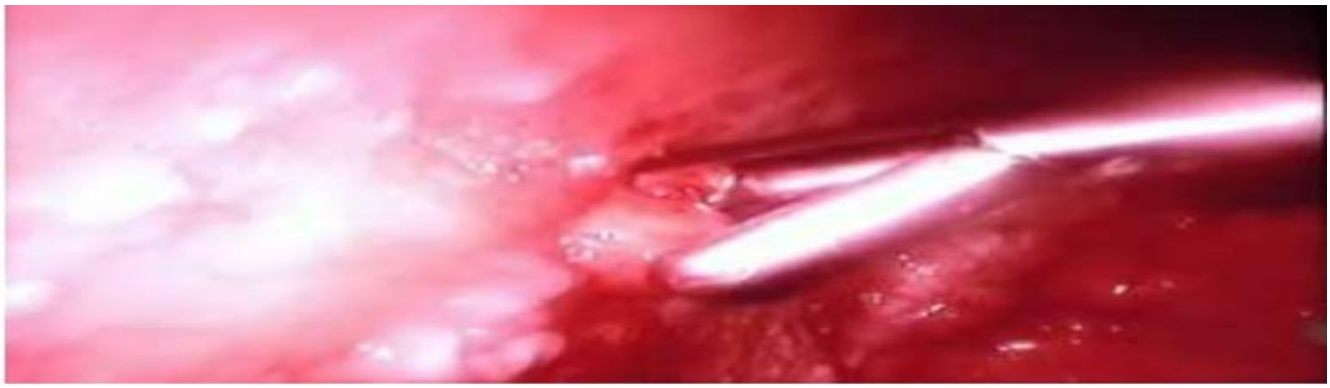

Figure 2S: Laparoscopic biopsy from peritoneal nodule.

Figure 3S: Laparoscopic view of diagrammatic nodules.