Scoring System for the prediction of the Severity of Placenta Accrete Spectrum (PAS) in Women with Placenta Previa (PAS scoring system)

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Abstract

Background: Antenatal diagnosis of PAS and a multidisciplinary team approach are necessary to reduce maternal and fetal intrapartum complications.

Objectives: To establish a scoring system for the prediction of the severity of placenta accrete spectrum (PAS) in women with placenta previa.

Methods: This is prospective observational study was conducted on 35 pregnant females with sonographic confirmation of placenta previa, All patients were subjected to complete detailed personal and medical history, complete gynecologic and obstetric history, general examination including vital signs systems review including examination of different systems, laboratory investigations including preoperative routine investigations (CBC, liver function tests, kidney function tests, coagulation profile, virology, detailed ultrasound examination for placental lacunae, bladder uterus interface vascularity, bladder line, uterine muscle thickness, loss of demarcation between uterus and placenta and cervical length as parameters of PAS scoring system.

Results: The mean age of study group was 31.14±5.80 years with mean body weight was 85.57 ±7.96 Kg, 11 females experienced antenatal vaginal bleeding. The mean PAS score in females without PAS , Accreta, Increta, Percreta was 4.00 1±.4, 8.60 ±1.72,12.50 ±1.29, 13.50 ±0.71 which was significantly higher in females with PAS p value < 0.001. The scoring system of PAS has (AUC =0.986, SE= 0.015) with p value<0.001 with cutoff point 5.5, sensitivity of 100%, specificity of 86%.

Conclusion: Scoring System for severity prediction of PAS is simple and feasible modality to ascertain the presence of PAS in women with placenta previa.

Keywords: PAS, Placenta Previa, Prenatal Diagnosis, scoring system,

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Introduction

Placenta accreta spectrum (PAS) appears when the chorionic villi invade into the muscle layer of the uterus [1]. Depending on how deeply the placental villi invade into the uterine muscle, known as the basalis of the decidua of the myometrium, there are PAS 2 types: placenta accreta and placenta increta.[2]. Percreta placenta appears when villi penetrate the myometrium and spread beyond the serosa [2].

The most important factor that increases the placenta previa (PP) prospect is the location of placenta low in the uterus and blocks the internal cervical opening [3]. The frequency of cesarean sections (CS) is increasing in parallel with the incidence of postoperative scar tissue (PAS). This is because trophoblastic villi can penetrate the uterine scar, which is a weaker region of the myometrium [4].

In pregnancy, PAS in high-risk patients' early detection is crucial for planning the correct management at delivery. This is because the placenta may adhere to the myometrium without detaching, leading to severe bleeding that can be life-threatening [5]; Patients with PAS might need preventive uterine artery embolization and blood transfusions [6].

In addition to clinical risk factors (CRF), imaging performances a critical role in the early detection of placental accreta spectrum (PAS). Ultrasound (US) serves as the primary imaging technique for this purpose. Both grayscale and color Doppler ultrasound have proven increasingly valuable in identifying abnormal placental invasion. In the trimesters of second and third, PAS key ultrasonographic indicators include the following: placental lacunae, thinning of the myometrium, the bladder wall interruption, increased the placental bed vascularity, and the clear zone loss. PAS presence can be reliably suspected by these signs when assessed properly [4,7]. This study aimed to create a scoring system to assess placenta accreta spectrum (PAS) severity in women who have placenta previa.

Methods

This is a prospective observational study was conducted at department of obstetrics and Gynecology of Menoufia University hospitals from October 2023 to April 2024 conducted on 35 pregnant females with sonographic confirmation of placenta previa diagnosis.

Ethical consideration: The study protocol received approval from the ethical committee at the Faculty of Medicine, Menoufia University. Written informed consent was obtained from all participants prior to the start of the trial. Every participant knew what was going to happen and may withdraw from the research at any time without explanation.

Participants had to be between the ages of 19 and 44 and have a confirmation of sonography of placenta previa after 28 gestational weeks to be eligible for the study. Women who were excluded had to have undergone an emergency referral for severe vaginal bleeding and needed surgery without a previous routine ultrasonographic examination at our hospital. Methods: All patients were evaluated in great detail, with a full medical history, physical exam, abdominal exam, and vaginal exam. Laboratory investigations included a complete blood count, Rh typing, a coagulation profile (prothrombin time, partial thromboplastin time, and INR), liver function tests, serum creatinine levels, and liver function tests. An ultrasound scan was also performed.

Estimated score scale for PAS:

Here are some of the ultrasonographic parameters that were examined: placental lacunae, vascularity at the interface of uterus-bladder, the anterior wall myometrial thickness, the hypoechoic retroplacental zone, the line of bladder, length of cervix, and previous cesarean sections history.

These seven characteristics formed the basis of a score system for evaluating the spectrum of placenta accreta (PAS).

Placental lacunas were classified based on the study of Finberg [8] as follows: level one, no lacunae detected; level two, one and three lacunae, typically round and small, less than two cm in size; level three, four and six lacunae, usually irregular, ranging from 2 to 4 cm; and level 4, extensive irregular lacunae covering significant portions of the placenta or the entire placenta, four cm or larger. The main of uterine wall at the site of attachment of placental was categorized as: level one, posterior; level two, lateral; and level three, anterior.

The interface of uterus–bladder vascularity was graded according to the study of Luo et al. [9] showed that levels 1–3 are to be considered: low flow, moderate flow, and fewer than ten vessels (often less than 1 mm in diameter). Level 2 is higher flow, with more than ten small vessels and/or numerous visible main vessels. Level 3 is the interface completely filled with vessels or bridging vessels.

According to the evaluation of the hypoechoic retroplacental zone, the myometrial thickness was classified into three levels: level 1, myometrium ≥1 mm with a clear zone; level 2, myometrium ≥1 mm with an ambiguous or lost zone; and level 3, myometrium <1 mm with a lost zone.

A complete and clear bladder line is indicated by a level 1, an unclear or irregular line by a level 2, and a lost line by a level 3.

There were three levels of cervical length classifications: level 1, greater than 3 cm; level 2, between 1 and 3 cm; and level 3, less than 1 cm.

The measurements of the myometrial thickness were taken in the sagittal plane at the lower anterior region, close to the internal cervix. In order to evaluate vascularity and myometrial thickness, a trained sonographer used transvaginal ultrasound, color Doppler, transabdominal ultrasound, and grayscale imaging.

Clinical procedures: Our research shows that the surgical team was informed of the anticipated PAS scores. Obstetricians with expertise in PAS performed cesarean sections on patients whose scores were 4 or higher. Patients whose scores were 3 or lower were considered to have an extremely low likelihood of PAS, on the other hand. Skilled surgeons or, in the case of hysterectomy, histological examination verified the PAS level. The patient was deemed to not have PAS if the placenta was delivered spontaneously.

Study outcome

Primary Outcome: Develop a scoring system to assess spectrum of placenta accreta (PAS severity) in women having placenta previa.

Secondary outcome: Estimate the incidence of neonatal and maternal outcomes based on the different levels of placenta accreta spectrum (PAS).

Statistical analysis

Statistical Package for the Social Sciences (SPSS) version 26 was utilized on an IBM compatible computer for data tabulation and analysis.

Normally distributed quantitative data was denoted by mean ($\bar{x}$) and standard deviation (SD), whereas qualitative data was denoted by number and percentage (No & %), and non-normally distributed quantitative data was depicted by median, interquartile range (IQR), and range.

The following test types are used in analytical statistics: chi-square test ($\chi 2$), one way ANOVA test (F), and the Kruskal Wallis test.

The receiver operator characteristic (ROC) curves were built with highest sensitivity and specificity cutoffs to assess the biomarker effectiveness. The test's accuracy is measured by the area under the ROC curve, or AUROC. A test's area of 0.5 is not meaningful, whereas a test's area of 1 is desired. For statistical significance, we set the cutoff at p-values less than 0.05.

Results

Demographic data and clinical characteristics were as follows: the study group had 31.14 years mean age, a mean body weight of 85.57 kg, and an average height of 165.06 cm. The children median number was 3, varying from 2 to 3. The mean age of gestation at recruitment was 33.74 weeks, and 11 pregnant women experienced antenatal vaginal bleeding. The details are illustrated in Table 1.

The frequency and distribution of the Placenta Accreta Spectrum (PAS) parameters, including grading scores related to placental lacunae, attachment of placental to the wall of utreus, factors such as the amount of prior cesarean sections, cervical length, myometrial thickness, and vascularity at the uterine-bladder contact, are shown in Table 2.

Table 3 showed the scoring system according to PAS, as a statistically substantial difference was found among without PAS females and with PAS females as regard placental lacunae grades as most of with PAS females had grade 3and 4 , also a statistically substantial difference was found among without PAS females and with PAS females as regard main uterine wall placental attachment, as most of with PAS females had level 3 placental attachment, also females with PAS significantly had more vascularity in the uterine bladder interface. Most females with PAS significantly had bladder line at level 2 and 3, Also, most females without PAS significantly had cervical length at level 1. Also females with PAS had significantly lower myometrial thickness and more times of CS,

Also as regard PAS score the mean score un females without PAS , Accreta, Increta, Percreta was 4.00 1±.4, 8.60 ±1.72,12.50 ±1.29, 13.50 ±0.71 which was significantly higher in females with PAS and was higher in patients having Percreta than Increta than Accreta p value < 0.001.

The outcome of maternal and fetal rendering to PAS are illustrated in table 4, no substantial difference was found among females without PAS, with accreta, with increta or placenta percreta females as regard uterine artery ligation, bladder injury, ICU admission, conservative CS, CS hysterectomy fetal outcome and the time of operation p value>0.05, While a statistically substantial difference was found as regard the need of hemostatic sutures and blood transfusion as females with PAS needed uterine hemostatic sutures and blood transfusion than without PAS p value 0.002 and 0.001 respectively. Also a statistically substantial difference was found regarding the type of CS as 85.7% females without PAS, 26.7% with accreta , had emergent CS. While one case with placenta percreta and no cases with placenta increta had emergent CS.

Diagnostic accuracy of scoring system in prediction of PAS is illustrated in table 5, the scoring system of PAS has (AUC =0.986, SE= 0.015) with p value<0.001 with cutoff point 5.5, sensitivity of 100%, specificity of 86%, accuracy of 94%, PPV of 91% and NPV of 100%.

Discussion

This was a prospective observational study included 35 pregnant women with placenta previa, aimed at developing a systemic score to predict the Placenta Accreta Spectrum likelihood.

Spectrum of Placenta Accreta (PAS) disorders involve several abnormal attachment types or trophoblastic cells invasion into the myometrium. Damage to the endometrial-myometrial interface is what causes this disorder to interfere with proper placentation. The outcome is an excessively deep penetration of the placental villi and an overabundance of trophoblastic infiltration due to insufficient decidualization at the uterine scar site [6].

Our study showed that our study group mean age was 31.14±5.80 years with mean

body weight was 85.57 ±7.96 Kg, the mean height was 165.06 ±6.25 cm, with median parity of 3 (2-3) offsprings, the age of gestation mean at recruitment was 33.74 ±2.56 weeks, there were 11 pregnant females experienced antenatal vaginal bleeding, Of the participants, 32 women had experienced at least 1 previous cesarean section.Which is in agreement with Shih et al.[10] his 170 women were included in the research, and their average age when they were diagnosed was 32.1 ± 4.7 years. One hundred twenty-two of them had undergone a caesarean section in the past, and forty-six had a history of uterine procedures like myomectomy or curettage. Twenty-one of the pregnant women in this study reported bleeding before the baby was born. At the time of sonographic diagnosis of placenta accreta, the mean age of gestation was 30.7 ± 2.2 weeks; at birth, it had increased to 34.3 ± 1.7 weeks. Also, Tovbin et al.[11] noticed that the average age of the mother at the ultrasound was 33.8 ± 4.5 years, and the mean age of gestation at diagnosis was 33.9 weeks of pregnancy. On average, there were 4.0 ± 1.6 gestations per mother, and 2.0 ± 1.2 live births per mother. There was a mean of gestational age of 37.7 ± 1.7 weeks at the delivery time. Zhang et al.[12] conducted a study that involve 532 women, whose ages ranged from twenty to fifty years and whose age of gestion at delivery ranged from 28 to 40.5 weeks. The aim was to validate a prenatal PAS score for diagnosing Placenta Accreta Spectrum (PAS). According to PAS classification there were 14(40%) pregnant females without PAS, 15 (42.9%) females with placenta accreta, 4 (11.4%) with placenta increta and 2(5.7%) with percreta. Among them there were 26 females had conservative CS while 9 had CS hysterectomy,16 females with PAS had uterine hemostatic sutures, Also the mean operative time was 35.71 ±1.56 minutes, also according to Neonatal APGAR score there were 23 neonates with good APGAR score, and 12 neonates were admitted to NICU. The study of Shih et al., [10] found that 39 patients were detected with Spectrum of Placenta Accreta (PAS) depend on criteria of antenatal sonographic. To prevent severe postpartum hemorrhage, cesarean hysterectomy was performed on 37 of these women. Final pathological analysis identified 6 cases (3%) of placenta accreta, 24 cases (24.6%) of placenta increta, and 9 cases (5.3%) of placenta percreta. Of the 170 patients, 131 (77%) were ultimately diagnosed with placenta previa without accrete. Saxena et al. [13] reported that 14.29% of cases with grade 1 PAS showed no invasion, while 85.71% exhibited invasion, including 9.52% with placenta percreta, 19.05% with placenta increta, and 57.14% with placenta accreta. Additionally, Luo et al. reported that 60 women (40%) were diagnosed with Placenta Accreta Spectrum (PAS). Within this group, placenta accreta was identified in 79 cases (20%), increta in 53 cases (13%), and percreta in 28 cases (7%). Also Saxena et al.[13] noticed that cesarean hysterectomy was performed on all women with PAS grades 1–3 (42%) due to placenta non-separation and the postpartum hemorrhage risk. In contrast, none of the women with PAS grade 0 (58%) required a hysterectomy; they underwent a cesarean section instead.

Regarding the PAS score, the average scores were 4.00 ± 1.4 for women without PAS, 8.60 ± 1.72 for those with accreta, 12.50 ± 1.29 for those with increta, and 13.50 ± 0.71 for those with percreta. Scores were significantly higher in women with PAS, with the highest scores observed in those with percreta, followed by increta and accreta, with a p-value of < 0.001. Moreover, all sonographic criteria used to determine the PAS score were significantly linked to the diagnosis of PAS, which aligns with the findings of Tovbin et al.[11] who observed a statistically substantial difference in the MAP prevalence across different probability groups based on the scoring system. The prevalence rates were 0.9% in the group of low probability, 29.4% in the group of moderate probability, and 84.2%

in the high probability group, with a p-value of < 0.0001. They also found that all criteria of sonography used in the scoring system were substantially related with MAP, with a p-value of < 0.0001.Which is also agreed with Ağaoğlu & Çağlar.[14] found that the mean PAS scores were 2.8 ± 1.4 for women without PAS, 3.6 ± 1.9 for those with accreta, 5.1 ± 2.4 for those with increta, and 9.8 ± 1.6 for those with percreta, with a p-value of 0.001. The score of PAS was significantly superior in the group of percreta related to the other groups (p = 0.000). However, there were no significant differences in scores of PAS among the no PAS, accreta, and groups of increta (p > 0.05).

Saxena et al.[13] observed that a substantial correlation was found among the prior cesarean sections number and the score of PAS (p = 0.004). The majority of women (52%) exhibited lacunae as an ultrasound finding, followed by loss of the clear zone (42%), bladder wall interruption (34%), uterovesical hypervascularity (16%), and increased vascularity in the inferior part of the placenta (8%).Additionally, a significant association was reported among the PAS score and the degree of placental invasion (p < 0.0001).Which is also agreed by Zhang et al.[12]and Del Negro et al.[14].

Gao et al.[15] found that a substantial correlation was discovered among sonographic criteria of PAS diagnosis and previous times of cesarean section with patients with PAS and its severity p value<0.05. Also, Zhang et al.[12] reported that a substantial correlation among PAS and factors such as placental location, placental thickness, the presence or absence of the retroplacental space, the thickness of the retroplacental myometrium, the presence of placenta lacunae, retroplacental myometrial blood flow, and a history of cesarean sections. However, there were no significant associations with the presence or absence of a cervical sinus, cervical morphology, or bladder line interruption.

The scoring system of PAS showed a high diagnostic performance with an AUC of 0.986 (SE = 0.015) and a p-value < 0.001 at a cutoff point of 5.5. It demonstrated 100% sensitivity, 86% specificity, 94% accuracy, 91% positive predictive value (PPV), and 100% negative predictive value (NPV). Shih et al. (2009) determined that 3D power Doppler, with a sensitivity of 97% and specificity of 92%, was the only criteria that provided the best accurate diagnosis of placenta accreta, as determined by ROC analysis. Although they had almost perfect specificities, the criteria "disrupted bladder mucosa" (18%) and "exophytic placenta invading the bladder" (10%) had low sensitivity for detecting placenta accreta, while the criteria "loss of retroplacental echolucent zone" and "abnormal lacunae" were less effective.

Which is consistent with Tobvin et al.[11] reported that for diagnosing MAP, a high probability score had 69.6 % overall sensitivity, 98.7% specificity , 84.2% positive predictive value, and 97.1%. negative predictive value When both high and moderate probability scores were considered, the sensitivity increased to 91.3% and the specificity was 93.6%, with an AUC of 0.94 (95% CI, 0.86–1.00).

Also consistent with Saxena et al.[13] reported that, using histopathology as the gold standard, the PAS score achieved 100% overall sensitivity, 90.62% specificity, 85.71%positive predictive value (PPV), 100% negative predictive value (NPV), and diagnostic accuracy of 94%.

Gao et al.[15] reported that the scoring system for diagnosing PAS had a sensitivity of 82.6%, specificity of 81.8%, positive predictive value of 82.6%, and negative predictive value of 81.8%. Clinical diagnosis indicated that 23 of the 45 patients in the scoring set had PAS, while 22 did not. The 37 cases where the diagnosis was in line with the "gold standard" resulted in a concordance rate of 82.2% (37/45).

Zhang et al.[12] found that using the final ultrasound scoring system, a total score of less than 3 points indicated no PAS. Placenta accreta was diagnosed with a score of 3 or higher, showing 84% sensitivity and 53% specificity. A score of 5 or higher identified PAS, with 69% sensitivity and 92% specificity. Placenta increta was diagnosed with a score of 7 or higher, yielding 58% sensitivity and 91% specificity. Finally, placenta percreta was identified with a score of 10 or more, with 74% sensitivity and 83% specificity.

In contrast to Yang et al.[16] discovered that the PAS scoring system had a sensitivity of 98.1%, specificity of 31.4%, and overall accuracy of 74.3% for detecting placenta percreta at a cutoff of 6 points. The prenatal ultrasound staging system and the placenta accreta scoring system both offered precise predictions for placenta percreta. When compared to clinical classification, their areas under the curve were 0.872 (95% CI: 0.793-0.951) and 0.864 (95% CI: 0.779-0.949), respectively, and the p-value was 0. 0001.

Luo et al.[9] found that using the threshold scores of <2.25, 2.25-6.20, 6.20-8.95, and ≥8.95 for diagnosing no PAS, accreta, increta, and percreta, respectively, the scoring system established a high positive predictive value (PPV) of 95.44% for no PAS and 81.81% for percreta. It also showed moderate PPVs of 80.26% for accreta and 75.47% for increta.

Del Negro et al.[14] found that when the PAS score was below 5.5, all patients were correctly classified as non-PAS (group 0). Conversely, patients with scores above 15.5 were accurately diagnosed with placenta percreta. However, a score of 13 showed an overlap between PAS and non-PAS cases. The analysis demonstrated strong performance metrics, with a 100% sensitivity, 89% specificity, 92% accuracy, and 0.94 AUC. To corroborate these findings and further verify the PAS score for prenatal prediction of morbidly adherent placenta, multicenter studies are needed, as this study had significant limitations, such as a limited sample size and being done at a single site.

Conclusion

The scoring system for predicting the severity of Placenta Accreta Spectrum (PAS) is a straightforward and practical method for determining the presence of PAS in women with placenta previa.The scoring system for predicting the severity of Placenta Accreta Spectrum (PAS) is a straightforward and practical method for determining the presence of PAS in women with placenta previa.

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Table (1): Maternal characteristics of studied participants (n=35)

Variable	No. of studied participants=35
Age (Years) Mean ±SD Range	 31.14 ±5.80 20-44
Weight (Kg) Mean ±SD Range	 85.57 ±7.96 69-105
Height (cm) Mean ±SD Range	 165.06 ±6.25 150-179
BMI (Kg/m^2) Mean ±SD Range	 31.48 ±3.34 25.04-42.22
Parity Median (IQR) Range	 3 (2-3) 0-6
Gestational age (Weeks) Mean ±SD Range	 33.74 ±2.56 28-37
Previous vaginal deliveries Median (IQR) Range	 0 (0-0) 0-4
Previous abortions Mean ±SD Range	 0 (0-1) 0-4
Antenatal vaginal bleeding (No& %) Present Absent	 11 (31.4%) 24 (68.6%)

SD: Standard deviation, IQR: Interquartile range, BMI: Body Mass Index

Table (2): Scoring system for prediction of PAS

Variable	No. of studied participants=35	
	No.	**%**
Placental lacunes 1 2 3 4	 1 20 11 3	 2.9 57.1 31.4 8.6
Main uterine wall of placental attachment 1 2 3	 8 7 20	 22.9 20 57.1

Vascularity in uterus-bladder interface 1 2 3	 18 14 3	 51.4 40 8.6
Bladder line 1 2 3	 17 11 7	
Cervical length 1 2 3	 23 11 1	
Myometrial thickness and hypoechoic retro-placental zone 1 2 3	 12 16 7	
Times of previous CS 0 1 2 ≥3	 3 6 9 17	
Total score Median (IQR) Range	7 (4-11) 2-14	

IQR: Interquartile range

Table (3): Scoring system according to PAS (n=35)

Variables	Without PAS (n=14)		Accreta (n=15)		Increta (n=4)		Percreta (n=2)		Test of significance	p-value
	No.	%	No.	%	No.	%	No.	%		
Placental lacunes										
1 2 3 4	1 12 0 1	7.1 85.7 0 7.1	0 8 6 1	0 53.3 40 6.7	0 0 4 0	0 0 100 0	0 0 1 1	0 0 50 50	χ2=22.36	**0.008***
Main uterine wall of placental attachment										
1 2 3	5 6 3	35.7 42.9 21.4	3 0 12	20 0 80	0 1 3	0 25 75	0 0 2	0 0 100	χ2=14.91	**0.018***
Vascularity in uterus-bladder interface										
1 2 3	13 1 0	92.9 7.1 0	5 10 0	33.3 66.7 0	0 3 1	0 75 25	0 0 2	0 0 100	χ2=40.43	**<0.001***
Bladder line										
1 2 3	13 1 0	92.9 7.1 0	4 8 3	26.7 53.3 20	0 2 2	0 50 50	0 0 2	0 0 100	χ2=27.03	**<0.001***

Cervical length										
1 2 3	8 5 1	57.1 35.7 7.1	14 1 0	93.3 6.7 0	0 4 0	0 100 0	1 1 0	50 50 0	χ2=15.31	**0.018***
Myometrial thickness and hypoechoic retro-placental zone										
1 2 3	12 2 0	85.7 14.3 0	0 11 4	0 73.3 26.7	0 3 1	0 75 25	0 0 2	0 0 100	χ2=34.78	**<0.001***
Times of previous CS										
0 1 2 ≥3	3 5 4 2	21.4 35.7 28.6 14.3	0 1 4 10	0 6.7 26.7 66.7	0 0 0 4	0 0 0 100	0 0 1 1	0 0 50 50	χ2=17.42	**0.036***
Total score										
Mean ±SD Range	4.00 1±.4 2-7		8.60 ±1.72 6-11		12.50 ±1.29 11-14		13.50 ±0.71 13-14		F=51.12	**<0.001***

*: Statistically significant, SD: Standard deviation, χ2: Chi-squared test, F: One Way ANOVA test

Table (4): Maternal and fetal outcome according to PAS (n=35)

Variables	Without PAS (n=14)		Accreta (n=15)		Increta (n=4)		Percreta (n=2)		Test of significance	p-value
	No.	%	No.	%	No.	%	No.	%		
Uterine artery ligation										
Yes No	12 2	85.7 14.3	15 0	100 0	4 0	100 0	2 0	100 0	χ2=3.18	0.468 (NS)
Hemostatic sutures Or uterine remodeling										
Yes No	2 12	14.3 85.7	12 3	80 20	3 1	75 25	1 1	50 50	χ2=13.53	**0.002***
Bladder injury										
Yes No	1 13	7.1 92.9	1 14	6.7 93.3	1 3	25 75	0 2	0 100	χ2=1.67	0.573 (NS)
Blood transfusion (Units)										
Median (IQR) Range	0.5 (0-1) 0-5		2 (1-2) 1-4		3.5 (2.25-4.75) 2-5		4.5 (4-5) 4-5		K=16.76	**0.001***
ICU admission										
Yes No	1 13	7.1 92.9	3 12	20 80	2 2	50 50	1 1	50 50	χ2=4.82	0.156 (NS)
Maternal outcome										
Conservative CS CS hysterectomy	13 1	92.9 7.1	9 6	60 40	3 1	75 25	1 1	50 50	χ2=4.75	0.184 (NS)
Fetal outcome										
Good APGAR NICU admission	10 4	71.4 28.6	10 5	66.7 33.3	3 1	75 25	0 2	0 100	χ2=4.20	0.306 (NS)

Type of operation										
Elective Emergent	2 12	14.3 85.7	11 4	73.3 26.7	4 0	100 0	1 1	50 50	$\chi 2$=14.39	**0.001***
Time of operation (Minutes)										
Mean ±SD Range	35.71 ±1.33 33-37		35.67 ±2.02 29-38		36.00 ±0.82 35-37		35.50 ±0.71 35-36		F=0.06	0.982 (NS)

*: Statistically significant, IQR: Interquartile range, SD: Standard deviation, $\chi 2$: Chi-squared test, K: Kruskal Wallis test, F: One Way ANOVA test

Table (5): Diagnostic accuracy of scoring system in prediction of PAS

Scoring system	
AUC	0.986
SE	0.015
p-value	**<0.001***
95% CI	0.957-1.000
Cutoff point	5.5
Sensitivity	100%
Specificity	86%
Accuracy	94%
PPV	91%
NPV	100%

AUC: Area under curve, SE: Standard error, CI: Confidence interval, PPV: Positive predictive value, NPV: Negative predictive value