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ORIGINAL ARTICLE

Urological lesions in patients undergoing obstetric hysterectomy secondary due to abnormal placental insertion in a high specialty hospital

Lesiones urológicas en pacientes sometidas a histerectomía obstétrica por inserción anómala de placenta en un hospital de alta especialidad

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Abstract

Objective: *The objective of the study was to describe frequency and identify risk factors for urological lesions in patients undergoing obstetric hysterectomy secondary to abnormal placental insertion in a high specialty hospital.* **Material and methods:** *A transversal, retrospective study of patients underwent hysterectomy due to abnormal placental insertion, from 2017 to 2019; age, obstetric antecedents, comorbidities, type of abnormal placental insertion type of hysterectomy, site of urinary lesion, anesthesia, surgery time, and bleeding were studied. Analyses were made with Chi-square and Kruskal–Wallis tests with SPSS V20.0 program considering significant p < 0.05.* **Results:** *Clinical records of 96 patients with age 32.6 ± 6.1 years were analyzed. Accretism was present in 38.5%, incretism in 19.8%, and percretism in 18.8%. Total hysterectomy was accomplished in 78 (81.2%) cases. Urinary lesion was present in 27 (28.1%); vesical in 19 (19.8%), ureteral in 6 (6.5%), and both in 2 (2.0%). Urinary lesion was significantly more frequent in those patients with more pregnancies (median 4 [interquartile range: 3-4] vs. 3 [2-4]; p = 0.004), more cesarean sections (4 [3-4] vs. 2 [1-3]; p < 0.001), hemorrhage (3000 mL [2000-4800] vs. 2000 mL [1200-3000]; p = 0.001), and more surgery time (3.75 h [3.5-4.0] vs. 3.0 [2.0-3.5]; p < 0.001).* **Conclusions:** *Urinary lesions in patients undergoing obstetric hysterectomy secondary to abnormal placental insertion are more frequent with higher number of pregnancies, cesarean sections, hemorrhage, and surgery time.*

Keywords: *Hysterectomy. Abnormal placental insertion. Urological lesion.*

Resumen

Objetivo: *Identificar los factores de riesgo asociados a lesiones urológicas en pacientes con histerectomía por inserción anómala de placenta.* **Material y métodos:** *Estudio transversal, retrospectivo, de pacientes sometidas a histerectomía por inserción anómala de placenta de 2017 a 2019. Se estudiaron edad, antecedentes obstétricos, comorbilidad, tipo de inserción placentaria, tipo de histerectomía, sitio de la lesión urinaria, anestesia, tiempo quirúrgico y sangrado. Se realizaron medidas de tendencia central y dispersión, frecuencias y proporciones. Los análisis se realizaron con las pruebas de ji al cuadrado y de Kruskal Wallis con el programa SPSS V.20.0, considerando significativa p < 0.05.* **Resultados:** *Se estudiaron 96 pacientes de 32.6 ± 6.1 años. Tuvieron acretismo el 38.5%,*

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incretismo el 19.8% y percretismo el 18.8%. Se hizo histerectomía total a 78 (81.2%). Presentaron lesión urinaria 27 (28.1%): vesical 19, ureteral 6 y ambas 2. La lesión urinaria fue más frecuente en las pacientes que tuvieron más gestas (4 [rango intercuartílico (RIQ): 3-4] vs. 3 [2-4]; p = 0.004), más cesáreas (4 [3-4] vs. 2 [1-3]; p < 0.001), mayor sangrado (3000 ml [2000-4800] vs. 2000 ml [1200-3000]; p = 0.001) y mayor tiempo quirúrgico (3.75 h [3.5-4.0] vs. 3.0 [2.0-3.5]; p < 0.001). **Conclusiones:** *La lesión urinaria fue más frecuente en las pacientes que tuvieron mayor número de gestas, más cesáreas, más sangrado y mayor tiempo quirúrgico.*

Palabras clave: *Histerectomía. Inserción anómala de placenta. Lesión urinaria.*

Introduction

Abnormal placentation refers to abnormal insertion of part or all the placenta, with total or partial absence of the decidua basalis and abnormality of the true decidua with chorionic villi penetration to the myometrium[1].

There are three varieties of placental abnormal adherence[2]: placenta accreta is an abnormal adherence of part or all the placenta to the uterine wall without the chorionic villi penetrating the myometrium; placenta increta is that in which the chorionic villi penetrate the myometrium; and placenta percreta occurs when there is penetration of the chorionic elements until they surpass the uterine serosa, being able to reach neighboring organs. For its extension, it can be focal, when it only involves small areas of the placenta; partial, when one or more cotyledons are involved in the process; or total, when the entire surface of the placenta is abnormally adhered[3]. The general term placenta accreta includes all placental invasion abnormalities, regardless of invasion depth[4]. Placenta percreta is the most severe form and is defined as the penetration of the entire myometrium thickness by the villi, which perforate the uterus and visceral peritoneum[5]. Hemorrhagic risk is linked to the rupture of the uterine vessels by the villi and their proteolytic enzymes, and to the impossibility of detaching the placenta at the time of delivery[6]. When placenta percreta is inserted on the lower segment (70% of cases), complications of low insertion increase, but if both these two eventualities occur on the scar of one or more cesarean sections, the conditions are met for the villi to rupture and pass through a scar, sometimes dehiscent, with silent uterine rupture being produced, at any stage of gestation or at delivery[7]. Once uterine rupture occurs, placental villi can continue their progression and invade neighboring pelvic structures, such as the urinary bladder, and affect the bladder trigone and both ureteral orifices, the retropubic space, the omentum, the mesentery, and iliac vessels[5].

The main symptoms are bleeding and urological signs, which may include dysuria or urinary frequency without urinary tract infection, but the most significant are hematuria that can appear since week 19. Initially, most are microscopic[8], they are always relapsing and can be pre-operative, intraoperative, or appear later.

Main risk factors for abnormal placental implantation are[9] age, multiparity, previous history of cesarean section with placenta previa, placenta previa with a history of three or more cesarean sections, history of uterine curettage, history of placental manual extraction, history of placental retention, and history of intra-amniotic infection. Placenta previa alone, without prior uterine surgery, is associated with 1-4% risk of placental accretism[10]. In a previous study at the National Institute of Perinatology, of 210 cases of placenta previa that were studied, in 37 (17.6%), placental accretism occurred; among these, in 26 (70.2%), there was a history of cesarean section. The authors showed that the larger the number of cesarean sections, the higher the frequency of accretism: 9.4% in patients who had no previous cesarean sections, 21.1% in those who had one, and 50% in those who had had two or more cesarean sections. The age group with the highest frequency of placenta accreta (26%) was the 35-39 years group[11].

Placenta accreta occurs in one out of every 2500 births, with an incidence ranging from 0.001 to 0.9% of deliveries[12]. Prenatal diagnosis and knowledge of the extent of placental invasion are essential for optimizing outcomes of patients with placenta accreta[2]. The consequences of placenta accreta can be severe, with maternal mortality rates of around 7%[13]. The form of resolution is by cesarean section, preferably scheduled and with a multidisciplinary approach, which includes the urogynecology department, as well as a vascular surgeon. The use of lung maturity inducers is preferred and, once this is documented by amniocentesis at 36-37 weeks, gestation is interrupted by cesarean section. Resolution can be carried out earlier if there is an emergency, such as incoercible bleeding, or if the patient goes into labor[1].

Main treatment is total obstetric hysterectomy, due to its frequent association with placenta previa and scarring from previous cesarean sections. This procedure is a challenge to the obstetrician's surgical skills[3]. Hysterectomy can lead to complications due to injury to adjacent organs and to severe comorbidity[14].

The management of placenta accreta can be accompanied by injuries to the intestine or uterine rupture[15]. Urinary tract injury during cesarean hysterectomy for invasive placenta is as high as 29%. In the context of persistent hematuria, normovolemia, urine leakage through the vagina, oliguria, and anuria, an unrecognized urological lesion should be considered[16]. Bladder injuries occur in 6-29% of cases and ureteral lesions in 2-6%[17]. In a previous study, this maternal morbidity was so high that in 39 of 54 reported cases of bladder invasion, there was urological injury, with bladder injury in 26%, urinary fistula in 13%, gross hematuria in 9%, ureteral injury in 6%, decreased bladder compliance in 4%, and cystectomy in 44%; as for mortality, there were 3 (5.6%) maternal deaths and 14 (25.9%) fetal deaths.

In the case of placenta percreta radical treatment, placement of a double J catheter due to suspicion does not seem to alter the risk of complications[18].

Urinary tract lesions can be intraoperatively diagnosed, such as bladder and ureter laceration, or postoperatively, such as vesicovaginal fistula, ureterovaginal fistula, and urethral stenosis[19].

In the literature, we found no previous reports of the risk factors associated with these complications in this specific group of patients. Such data are necessary for the magnitude of the problem to be known, since abnormal placental insertion is common. Early identification of the risk factors associated with urinary tract injury will allow us anticipating the necessary measures, both for the diagnosis and treatment of abnormal placental insertion, to avoid, to the extent possible, the occurrence of these complications.

The purpose of this study was to identify the frequency of urinary injury and the risk factors associated with it in patients undergoing obstetric hysterectomy due to abnormal placental insertion in a high specialty hospital.

Methods

After authorization by the Hospital Research Ethics Committee and the Local Research Committee, an observational, retrospective, cross-sectional, analytical study was carried out, in which the medical records of patients undergoing hysterectomy due to abnormal placental insertion were reviewed at National Medical Center La Raza Obstetrics-Gynecology Hospital No. 3 "Dr. Víctor Manuel Espinosa de los Reyes Sánchez" High Specialty Medical Unit, a tertiary care hospital of the Mexican Social Security Institute, from January 2017 to January 2019. Parity, patient age, history of previous cesarean sections, type of placental insertion anomaly, type of hysterectomy (total or subtotal), surgical time, estimated bleeding, and presence or absence of urinary tract injury, and if applicable, its site, were recorded. For descriptive statistics, frequencies, proportions, central tendency, and dispersion measures were used, and to look for associations between the different risk factors and the occurrence of urinary tract injury, Student's t-test or Mann–Whitney U-test, Chi-square test or Fisher's exact test, and Kruskal–Wallis test were used. Analyses were carried out with the SPSS statistical package, version 22.0. $p < 0.05$ was considered statistically significant.

The study obtained the registration number from the Research Ethics and Health Research Committees and adhered to the ethical principles of the Declaration of Helsinki and the Regulations of the General Statute of Health on research and regulation matters. This is a risk-free study on a vulnerable population (pregnant women), with an adequate risk-benefit balance. At all times, confidentiality of participants is preserved, since the databases only contain folio numbers and the information that could help participants' identification is kept encoded separately and in the possession of the main investigator (C.R. Jiménez Vieyra).

Results

The medical records of 96 patients aged 32.6 ± 6.1 years (range: 18-46) were studied. Median pregnancies were 3, with an interquartile range (IQR) of 2-4; median cesarean sections were 2 (1-3). Seven patients (7.3%) had diabetes mellitus and arterial hypertension, 7 patients (7.3%). Other less common diseases were systemic lupus erythematosus, hypothyroidism, mitral valve prolapse, epilepsy, deep vein thrombosis, asthma, and rheumatoid arthritis (one patient each). Thirty-seven patients (38.5%) had placenta accreta; 19 (19.8%), placenta increta; 18 (18.8%), placenta percreta; and 12 (12.5%), placenta previa, all documented by ultrasonographic report; in 10 patients (10.4%), documenting the exact

type of abnormal insertion was not possible by histopathological examination. Median bleeding was 2000 mL (IQR: 1300-3425; range: 500-7000), and mean surgical time was 3 h (IQR: 2.5-3.5).

Seventy-eight out of 96 patients (81.3%) underwent total hysterectomy and 18 out of 96 (18.8%), subtotal. Total hysterectomy was performed in 32 of 37 patients with placenta accreta (86.5%), in 14 of 19 with placenta increta (73.7%), in 16 of 18 with placenta percreta (88.9%), in 10 of 12 with placenta previa (83.3%), and in 6 of 10 in whom the type of abnormal insertion was not histologically documented (60%).

In 27 patients (28.1%), there was urinary tract injury (Table 1). Regarding the type of abnormal insertion they had, 12 (44.5%) had placenta percreta, 6 (22.2%) placenta accreta, 6 (22.2%) placenta increta, 2 (7.4%) placenta previa, and in 1 (3.8%) the type was not histologically identified. In 21 of 27 patients (77.8%), total hysterectomy was necessary, and in 6 of 27 (22.2%), subtotal hysterectomy was performed. Performing subtotal hysterectomy was possible in three patients with placenta percreta, in one with placenta accreta, in one with placenta increta, and in one with placenta previa.

As for the site of injury, in 19 of 27 patients (70.4%), it was in the bladder; in 6 of 27 (22.2%), it was ureteral; and in 2 of 27 (7.4%), it was both in the bladder and ureter. Of the 19 bladder injuries, nine were invasion, four were fistulae, five were section, and one was ligation. Of the six ureteral injuries, five were ureter ligations and one was section. Of the two patients who had bladder and ureteral injury, both had fistula, one with invasion and one with section. Of the 19 bladder injuries, in 15, the diagnosis was made intraoperatively and in four in the post-operative period; of the six patients with ureteral injury, in three, the diagnosis was intraoperative, and in three, it was post-operative; and for patients with injury in both sites, one was diagnosed in the intraoperative period and one in the post-operative period. Of the 19 bladder injuries, in 11, the diagnosis was made by direct visualization, in four using methylene blue and in four by cystoscopy. For the diagnoses of the six ureteral lesions, three were by direct visualization, two by ureterocystoscopy and one by computed tomography urography and excretory urography. One patient with bladder and ureter injury was diagnosed by ureterocystoscopy, and the other by direct visualization, computed tomography urography, and excretory urography.

Regarding the urinary tract injury approach, only in nine of the 27 cases, it was repaired by the gynecologist; in the remaining 18, it was by the urology specialist. The most commonly used type of anesthesia was regional, in 61 patients (63.5%), followed by general anesthesia in 35 (36.5%).

When the patients were compared according to the type of abnormal placental implantation, in those with placenta previa, the number of previous cesarean sections and bleeding was significantly lower, while bleeding was significantly higher in patients with placenta percreta. There were no significant differences in terms of age, number of pregnancies, or surgical time (Table 2).

In the analysis to identify risk factors associated with urinary tract injuries, patients who had urinary tract injury had a significantly higher number of pregnancies (median: 4 [3-4] vs. 3 [2-4]; $p = 0.004$), more cesarean sections (median: 4 [3-4] vs. 3 [1-3]; $p = 0.004$), higher frequency of placental percretism (70.6 vs. 29.4%; $p = 0.001$), longer surgical time (median: 3.7 h [3.5-4.0] vs. 3.0 h [2.0-3.5]; $p < 0.001$), and more intraoperative bleeding (median: 3000 mL [2000-4800] vs. 2000 mL [1200-3000]; $p = 0.001$), and in them, the use of general anesthesia was more common (57.1 vs. 42.9%; $p < 0.001$) than in patients who had no injuries (Table 3).

Discussion

The Gynecology-Obstetrics Hospital No. 3 of the National Medical Center *La Raza* is a reference hospital for patients with abnormal placental insertion. On average, every year this hospital treats more than 128 women with this pregnancy-associated pathology, and it can be a condition that even warrants obstetric hysterectomy. This procedure is complex because it deals with a condition associated with obstetric hemorrhage, which entails a high rate of maternal and fetal morbidity and mortality, and can affect the reproductive future of those who suffer from it[2].

In our study, 63 cases occurred in women older than 30 years of age, which is consistent with previously reported data[9]. No disease that would increase the risk of abnormal placental implantation was found in 72.9% of the patients, and we did not identify any significant association between the presence of urinary tract injury and patient comorbidities, which were mostly chronic conditions such as hypertension and diabetes mellitus.

Regarding previous history of cesarean section surgery when obstetric hysterectomy was performed, 33.3% of the patients were observed to be in a second pregnancy with a previous cesarean section, one patient

Table 1. General characteristics of patients with urinary tract injury

Folio number	Age (years)	Pregnancies (N)	Cesarean sections (N)	Deliveries (N)	Abortions (N)	Placental insertion anomaly	Type of hysterectomy	Urinary lesion site	Type of injury	Injury diagnosis time	Injury mechanism	Injury detection
4	37	4	3	0	1	Increta	Total	Both	Section + fistula	Post-operative	Section	Ureterocystoscopy
11	24	2	2	0	0	Accreta	Total	Bladder	Invasion	Intraoperative	Section	Direct visual
16	37	3	3	0	0	Percreta	Total	Bladder	Invasion	Intraoperative	Section	Direct visual
23	25	4	4	0	0	Accreta	Total	Bladder	Invasion	Intraoperative	Section	Direct visual
24	25	3	3	0	0	Percreta	Total	Bladder	Invasion	Intraoperative	Section	Direct visual
26	45	11	9	0	1	Percreta	Total	Both	Invasion + fistula	Intraoperative	Section	Direct visual + other
32	43	4	3	0	1	Accreta	Total	Bladder	Fistula	Post-operative	Burn	Cystoscopy
34	28	3	2	0	1	Percreta	Total	Ureteral	Ligation	Intraoperative	Ligation	Direct visual
36	44	4	3	0	1	Percreta	Total	Bladder	Fistula	Post-operative	Burn	Cystoscopy
37	35	3	2	1	0	Percreta	Total	Bladder	Invasion	Intraoperative	Section	Direct visual
28	35	2	2	0	0	Percreta	Subtotal	Ureteral	Ligation	Intraoperative	Ligation	Direct visual
41	31	4	4	0	0	Accreta	Total	Bladder	Section	Intraoperative	Section	Direct visual
45	43	3	3	0	0	N/D	Total	Bladder	Section	Intraoperative	Section	Direct visual
51	38	8	5	0	3	Increta	Total	Bladder	Fistula	Post-operative	Burn	Cystoscopy
54	32	3	1	2	0	Previa	Subtotal	Bladder	Ligation	Intraoperative	Section	Direct visual
56	32	4	3	0	1	Accreta	Total	Bladder	Invasion	Intraoperative	Section	Methylene blue
58	33	4	2	0	2	Accreta	Subtotal	Bladder	Invasion	Intraoperative	Unknown	Methylene blue
60	40	2	1	0	1	Percreta	Total	Ureteral	Section	Post-operative	Section	Ureterocystoscopy
63	39	4	3	1	0	Previa	Total	Ureteral	Ligation	Post-operative	Unknown	Ureterocystoscopy
79	29	3	3	0	0	Percreta	Total	Bladder	Section	Intraoperative	Section	Direct visual
80	32	4	4	0	0	Increta	Total	Bladder	Invasion	Intraoperative	Section	Direct visual
83	40	3	3	0	0	Increta	Subtotal	Bladder	Section	Intraoperative	Section	Direct visual
85	31	5	2	3	0	Percreta	Total	Bladder	Invasion	Intraoperative	Section	Methylene blue
89	31	4	3	0	1	Increta	Total	Ureteral	Ligation	Post-operative	Ligation	Other
91	38	5	3	1	1	Percreta	Subtotal	Bladder	Fistula	Post-operative	Unknown	Cystoscopy
94	29	4	2	0	2	Increta	Total	Bladder	Section	Intraoperative	Section	Methylene blue
96	36	6	3	1	2	Percreta	Subtotal	Ureteral	Ligation	Intraoperative	Ligation	Direct visual

Table 2. Characteristics according to abnormal implantation type

Variable	Total (n = 96)	Type of abnormal insertion				p
		Acreta (n = 35)	Increta (n = 16)	Percreta (n = 17)	Previa (n = 11)	
Age (years)	32 [28-38]	31 [28-35]	35 [31-40]	36 [30-40]	32 [27-39]	0.100
Pregnancies	3 [2-4]	3 [2-4]	4 [3-4]	3 [2-5]	2 [2-3]	0.059
Cesarean sections	2 [1-3]	2 [2-3]	3 [1-3]	3 [2-3]	1 [1-2]	0.029*
Bleeding (mL)	2000 [1300-3425]	2000 [1200-3000]	2900 [1800-3950]	3500 [1900-4900]	1500 [1200-2500]	0.016*
Surgical time (h)	3.0 [2.5-3.5]	3.0 [2.5-3.5]	3.5 [3.0-4.0]	3.5 [2.0-4.0]	3.0 [2.5-3.7]	0.564

*Kruskal–Wallis test.
Medians [interquartile range] are reported.

Table 3. Characteristics according to the presence of urinary tract injury

Variable		Total (n = 96)	Urinary tract injury		p
			No (n = 69)	Yes (n = 27)	
Age (years)		32 (28-38)	32 (28-37)	35 (31-39)	0.080
Pregnancies		3 (2-4)	3 (2-4)	4 (3-4)	0.004*
Cesarean sections		2 (1-3)	3 (1-3)	4 (3-4)	< 0.001*
Insertion abnormality, N (%)	Previa	11 (100)	9 (81.8)	2 (18.2)	0.001†
	Acreta	35 (100)	29 (82.9)	6 (17.1)	
	Increta	16 (100)	10 (62.5)	6 (37.5)	
	Percreta	17 (100)	5 (29.4)	12 (70.6)	
Type of hysterectomy, N (%)	Total	78 (100)	57 (73.1)	21 (26.9)	0.586
	Subtotal	18 (100)	12 (66.7)	6 (33.3)	
Type of anesthesia N (%)	Regional	61 (100)	54 (88.5)	7 (11.5)	<0.001†
	General	35 (100)	15 (42.9)	20 (57.1)	
Bleeding (mL)		2000 (1300-3425)	2000 (1200-3000)	3000 (2000-4800)	0.001*
Surgical time (h)		3.0 (2.5-3.5)	3.0 (2.0-3.5)	3.7 (3.5-4.0)	<0.001*

*Kruskal–Wallis test.
†Chi-square test.
Medians [interquartile range] and frequencies (percentages) are reported.

was in her third pregnancy with two previous cesarean sections, and the highest number of cesarean sections corresponded to a patient in her 11th pregnancy with nine previous cesarean sections; in total, 69.8% of the patients had previous cesarean sections, which is consistent with the observations published by Wu et al.[9] who report a percentage of previous cesarean sections of 67%. On the other hand, there were three cases of obstetric hysterectomy in women with a first pregnancy (2.8%); in two of them, the hysterectomy was performed during their first cesarean section, and in the other patient, it was postpartum, with the placental accretion diagnosis being corroborated by histopathology, despite, theoretically, not having associated risk factors, which is also consistent with the previous literature, in which a risk of abnormal placentation has been found in 1-4% of patients, even without previous surgical history[10].

The most frequently performed type of hysterectomy was total hysterectomy (81.3% of cases). Although the literature indicates that the type of hysterectomy should be individualized, there is a preference for

performing subtotal hysterectomy, given that it is considered that it can reduce surgical time[20]. However, in this study, a higher percentage of urinary tract injury was documented with subtotal hysterectomy (33%), which increased surgical time for its repair.

Of the 27 patients who had urinary tract injury, the most common site was the bladder, in 19 of 27 patients (70.4%), followed by the ureter in 6 of 27 (22.2%). This is consistent with the literature, which reports a frequency of bladder injury ranging from 6 to 29% and ureteral injury from 2 to 6%[17]. According to the previous reports, during hysterectomy secondary to cesarean section for invasive placenta, the frequency of urinary tract injury is as high as 29%[18]; however, in our study, we identified 11 cases with urinary tract injury, out of which 7 (63.3%) had bladder injury, which is twice the published percentage. We believe that this is because our study included higher degrees of invasion and a higher frequency of risk factors associated with this invasion, which made for our number of cases to increase.

Fortunately, detection of the lesion was intraoperatively performed in 70% of cases, which improved patient prognosis and decreased the risk of postsurgical complications, as it was also reported by Washecka and Behling[18], due to a correct and timely repair of the lesion.

The repair was carried out by the urology department in 66.3% of cases, and the rest was taken care of by the gynecology department, with personnel trained for the repair, which highlights the importance of care by a multidisciplinary team[13].

In no case was ureteral catheterization necessary to prevent injury despite the suspicion of placental percretism; anyway, the previous studies indicate that said procedure does not usually alter the risk of complications[18].

The finding in our study that increased bleeding is associated with a higher probability of urinary tract injury confirms what was previously reported by Alcocer et al.[21] who also identified it among the risk factors in women with urinary tract injury during cesarean section[21].

Regarding the search for risk factors associated with the presence of urinary tract injury, the previous studies have focused on small groups of gynecological patients[22,23] or oncological patients[24]. After our literature search, to the best of our knowledge, this is the first study in patients with urinary tract injury secondary to obstetric hysterectomy for abnormal placental insertion.

Conclusions

The risk factors for urinary tract injury in patients who underwent obstetric hysterectomy due to abnormal placental insertion in our study were a history of multiple pregnancies, previous cesarean sections, higher degrees of abnormal insertion, longer surgical time, and higher bleeding during surgery.

Abnormal placental insertion is a life-threatening obstetric condition that occurs in pregnant women. At present, there is an increase in the performance of cesarean sections, curettage, and uterine surgeries. The previous history of any of these surgeries is an important risk factor for the presence of placentation alterations, for cesarean section performance, and for the need for obstetric hysterectomy.

Urinary tract injury is a complication that can lead to prolonged hospital stay and entails a higher risk of other complications such as infections or thrombotic events and, consequently, higher costs for patients, their families, and health services.

It is necessary for urologists and urogynecology specialists to be trained in the pre-operative, intraoperative, and post-operative management of this complication.

Conflicts of interests

The authors declare that they have no conflicts of interest with regard to this manuscript.

Ethical disclosures

Protection of human and animal subjects. The authors declare that no experiments have been performed on humans or animals for this research.

Confidentiality of data. The authors declare that they have followed the protocols of their work center on the publication of patient data.

Right to privacy and informed consent. The authors declare that no patient data appear in this article. This study was approved by the Health Research Ethics Committee and the Local Health Research Committee (registry number R-2019-3504-010).

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