

CHARACTERISTIC OF IATROGENIC BLADDER TRAUMA PATIENT IN HASAN SADIKIN GENERAL HOSPITAL FROM JANUARY 2013 - JANUARY 2018

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ABSTRACT

Objective: This study was conducted to determine the characteristics of iatrogenic bladder trauma in Hasan Sadikin General Hospital from January 2013 – January 2018. **Material & Methods:** The study was conducted by retrospective descriptive methods. We reviewed iatrogenic bladder trauma from medical record at Hasan Sadikin General Hospital from January 2013 to January 2018. The data obtained is subsequently recapitulated and processed using a spreadsheet. **Results:** Most of the cases were found in female patients. There were 30 cases (73.17%) are recorded. Whilst on male patients, there were only 11 cases (26.83%). The average age was 42.35 ± 2.35 years old. According to AAST grading, a total of 2 patients (4.88%) experienced AAST grade V, 28 patients (68.29%) experienced AAST grade IV, 8 patients (19.51%) experienced AAST grade III, and 3 patients (7.31%) experienced AAST grade I. In addition, there were 31 (75.61%) iatrogenic injuries due to gynecologic surgery, 6 (14.63%) iatrogenic injuries due to digestive surgery, and 4 (9.76%) iatrogenic injuries due to endourology surgery. Of all cases, 30 patients (73.17%) underwent immediate intraoperative reconstruction surgery, whilst the other 11 (26.83%) underwent delayed reconstruction surgery. As for the management, 33 (80.49%) patients underwent bladder repair, 1 (2.44%) patients underwent palliative cystectomy, 2 (4.88%) patients underwent damage control surgery, 3 (7.32%) patients underwent bladder exploration, and 2 (4.88%) patients underwent urethral catheter insertion. From all of 41 cases of patients with iatrogenic bladder injury, there were 3 (7.32%) mortality cases due to prolonged bleeding and sepsis. **Conclusion:** In this study, iatrogenic bladder trauma mostly affected female patients that underwent gynecologic surgery on the age group of 41-50 years old. Almost all of the cases were treated by bladder repair. By knowing the epidemiology of iatrogenic bladder injury and perform prompt treatment then we can take precautions to reduce the level of morbidity and mortality.

Keywords: Bladder trauma, iatrogenic injury.

ABSTRAK

Tujuan: Penelitian ini bertujuan untuk mengetahui karakteristik trauma kandung kemih iatrogenik di Rumah Sakit Dr. Hasan Sadikin dari Januari 2013 hingga Januari 2018. **Bahan & Cara:** Penelitian ini dilakukan dengan metode deskriptif retrospektif. Kami mengambil data trauma kandung kemih dari rekam medis Rumah Sakit Dr. Hasan Sadikin Bandung periode Januari 2013 hingga Januari 2018. Data yang diperoleh kemudian direkapitulasi serta diolah menggunakan spreadsheet. **Hasil:** Kasus paling banyak ditemukan pada pasien wanita yaitu sebanyak 30 (73.17%) kasus. Sedangkan pada pasien laki-laki sebanyak 11 (26.83%) kasus. Usia rata-rata adalah 42.35 ± 2.35 tahun. Berdasarkan derajat penilaian AAST, 2 (4.88%) pasien mengalami AAST derajat V, 28 (68.29%) pasien mengalami AAST derajat IV, 8 (19.51%) pasien mengalami AAST derajat III, dan 3 (7.31%) pasien mengalami AAST derajat I. Berdasarkan penyebabnya, terdapat 31 (75.61%) kasus yang mengalami trauma kandung kemih iatrogenik akibat operasi ginekologis, 6 (14.63%) kasus disebabkan oleh operasi digestif, dan 4 (9.76%) kasus disebabkan oleh operasi endourologi. Dari keseluruhan pasien terdapat 30 (73.17%) pasien yang menjalani operasi rekonstruksi intraoperatif segera, sedangkan 11 (26.83%) pasien lainnya mendapatkan operasi rekonstruksi yang tertunda. Terdapat 33 (80.49%) pasien mendapat penatalaksanaan berupa operasi repair kandung kemih, 1 (2.44%) pasien menjalani sistektomi paliatif, 2 (4.88%) pasien menjalani operasi damage control, 3 (7.32%) pasien menjalani eksplorasi kandung kemih, dan 2 (4.88%) pasien hanya dilakukan pemasangan kateter uretra. Dari seluruh 41 kasus trauma kandung kemih iatrogenik, terdapat 3 (7.32%) kasus kematian yang diakibatkan oleh perdarahan berkepanjangan dan sepsis. **Simpulan:** Pada penelitian ini, trauma kandung kemih iatrogenik paling sering terjadi pada wanita yang menjalani operasi ginekologis dengan kelompok usia 41-50 tahun. Hampir seluruh kasus ditangani dengan repair kandung kemih. Dengan mengetahui epidemiologi trauma kandung kemih iatrogenik dan melakukan repair segera maka pencegahan guna mengurangi tingkat morbiditas dan mortalitas dapat dilakukan.

Kata Kunci: Trauma kandung kemih, cedera iatrogenik.

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INTRODUCTION

The bladder is the urological organ that most often suffers iatrogenic injury. Iatrogenic bladder trauma occurs frequently during pelvic surgery. According to a study conducted by Shik Lee et al., bladder trauma is the most common urological injury in obstetric and gynecologic surgeries. Varieties in staging, the time needed for complete examinations and other difficulties in diagnosis may delay decision making. Iatrogenic bladder trauma can be divided into internal trauma and external trauma. Internal trauma of the bladder is often caused by endoscopic urological surgeries, whereas external trauma is generally caused by gynecological, general, and urological surgeries. Hysterectomy and transurethral resection of bladder tumor were the most common procedures that cause iatrogenic bladder trauma.¹⁻²

According to Teguh Risesa Jufri et al study, there were 16 iatrogenic bladder trauma, out of all patients who underwent obstetric and gynecologic surgeries at H. Adam Malik General Hospital, Medan from January 2011 to December 2015.³ Christopher et al studied that 12 cases of iatrogenic bladder trauma occurred at University Kebangsaan Malaysia Medical Centre, Kuala Lumpur, Malaysia from 1999 to 2009.⁴

Iatrogenic bladder trauma should be detected intraoperatively at the time it occurs. A study by Adelman et al stated that over the last 10 years, with the number of article studies found <100 cases, more than 80% were found intraoperatively. In addition to direct visualization of injured tissue intraoperatively, external bladder traumas may be suspected as urine was found in the operative field, the air in the Foley catheter collection bag, or direct visualization of the Foley catheter. Intraoperative internal bladder trauma may result in new onset symptoms, such as abdominal distension, difficulty maintaining bladder distension with instilled fluid, and visualization of urine outside bladder.³⁻⁵

Perioperative iatrogenic bladder trauma may present in some clinical signs and symptoms, such as suprapubic pain, hematuria, and oliguria.⁶ The most common symptoms for iatrogenic bladder

trauma are gross hematuria and abdominal tenderness. The patients may also complain about peritonitis, abdominal distention, abdominal pain and maybe progress to sepsis if not treated promptly.^{2,6}

There are some helpful tools in diagnosing iatrogenic bladder trauma. The inability to confirm the diagnosis with immediate and direct visualization can be solved by intraoperative cystoscopy and intentional. In addition, during intraoperative injury that is either unvisualized or difficult to localize, the instillation of methylene blue dye into the bladder followed by careful observation for extravasation was known useful for further management.^{5,7}

Moreover, perioperative ultrasound examination is a quick and useful tool for measuring bladder volumes and identifying pelvic or abdominal fluid. In other hand, ultrasound often lacks abilities to attribute abdominal or pelvic fluid from a specific source and thus is not considered sufficient for diagnosing bladder injuries. In the perioperative setting, CT cystography has become the gold standard diagnostic examination for clinically suspected iatrogenic bladder injury. In extraperitoneal injury, cystography may show extravasation to the pelvic cavity, while in intraperitoneal injury contrast extravasation may appear in intraabdominal spaces and outline bowel loop. CT urography may provide superior diagnostic information and broader differential diagnosis, contrast evaluation of the ureters and bladder.⁸⁻⁹

OBJECTIVE

This study was conducted to determine the characteristics of iatrogenic bladder trauma in Hasan Sadikin General Hospital from January 2013-January 2018.

MATERIAL & METHODS

The selected study population was a population of patients with iatrogenic bladder trauma admitted to the Urology Department Hasan Sadikin General Hospital in 2013-2018. We obtained

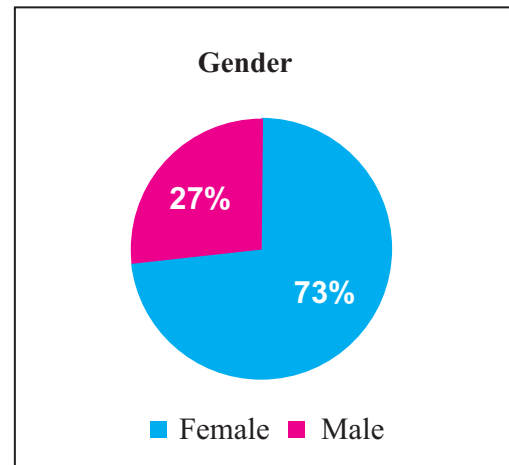
secondary data from medical records of bladder trauma. The inclusion criteria of the study were all patients that had been diagnosed as iatrogenic bladder trauma. The exclusion criteria of the subjects were patients with other congenital abnormalities as the primary diagnosis and incomplete medical record. There were 41 patients with iatrogenic bladder trauma admitted to Urology Department Hasan Sadikin General Hospital in 2013-2018.

This was a retrospective descriptive study. The data was obtained from medical records of iatrogenic bladder patients admitted to Urology Department Hasan Sadikin General Hospital in 2013-2018.

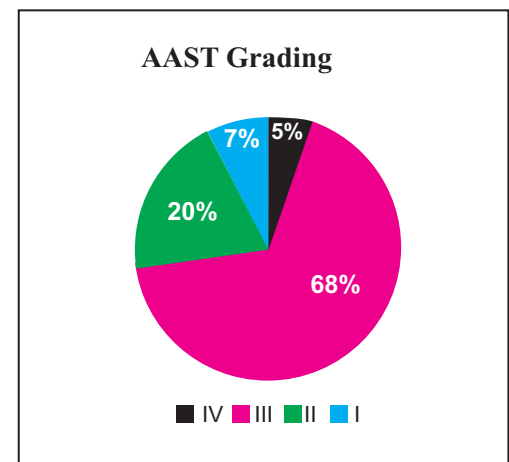
The data collected from the study was descriptive (sociodemographic characteristics, type of surgery, grade of trauma, management, and outcome). The data was analyzed using descriptive method.

RESULTS

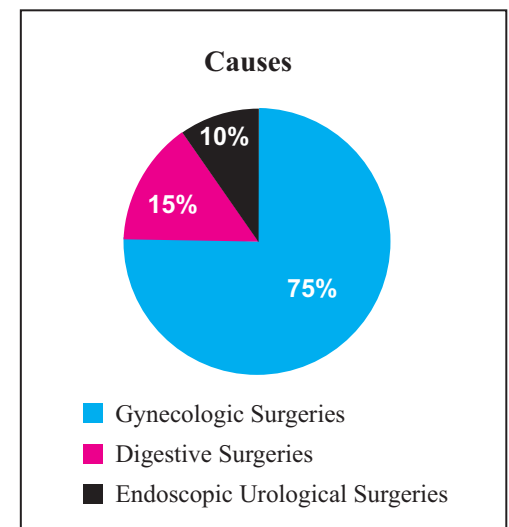
This study had included 41 patients with iatrogenic bladder trauma admitted to Urology Department Hasan Sadikin General Hospital in 2013-2018. Most of the cases were found in female patients with recorded 30 cases (73.17%), whereas on male patients, there were only 11 cases (26.83%) (Graphic 1). The average age was 42.35 ± 2.35 years old. According to AAST grading, 2 patients (4.88%) experienced AAST grade V, 28 patients (68.29%) experienced AAST grade IV, 8 patients (19.51%) experienced AAST grade III, and 3 patients (7.31%) experienced AAST grade I (Graphic 2). In addition, there were 31 (75.61%) iatrogenic bladder traumas due to gynecologic surgeries, 6 (14.63%) iatrogenic injuries due to digestive surgeries, and 4 (9.76%) iatrogenic injuries due to endoscopic urological surgeries (Graphic 3). Of all cases, 30 patients (73.17%) underwent immediate intraoperative reconstruction surgeries, whilst the other 11 patients (26.83%) underwent delayed reconstruction surgeries (Graphic 4). As for the management, 33 (80.49%) patients underwent bladder repairs, 1 (2.44%) patients underwent palliative cystectomy, 2 (4.88%) patients underwent damage control surgeries, 3 (7.32%) patients underwent bladder explorations, and 2 (4.88%) patients underwent urethral catheter insertions (Graphic 5). There were 3 (7.32%) mortality cases due to prolonged bleeding and sepsis.



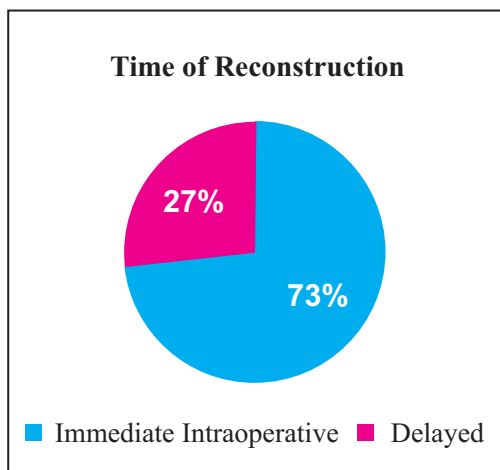
Graphic 1. Gender.



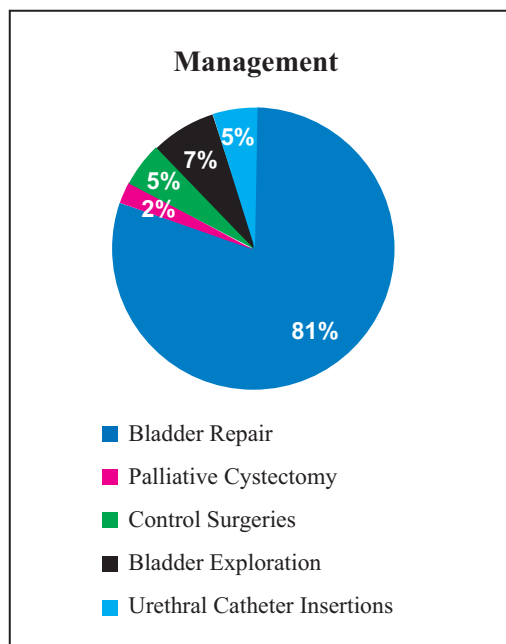
Graphic 2. AAST Grading.



Graphic 3. Causes of Injuries.



Graphic 4. Time of Reconstruction.



Graphic 5. Managements.

DISCUSSION

Urinary tract injury is the most common complication of pelvic surgeries. Its incidence is reported to be 0.5 to 1.5%, and bladder injury is more common than ureter injury. Most bladder injuries, but only one third of all ureter injuries, are identified during surgery.¹ Procedures performed by urologists, obstetricians, gynecologists, and general surgeons have traditionally accounted for the majority of iatrogenic injuries to this region. The most common

indication for pelvic surgery was leiomyoma of the uterus, and the most common type of surgery was transabdominal hysterectomy. This may be due not only to the fact that wide dissection was performed during surgery, but also that its main indication was gynecologic cancer, which may cause pelvic adhesion and changes in normal pelvic configuration. This can be explained by the fact that it is hard to dissect the bladder with adhesions.²

At one institution, iatrogenic bladder injuries occurred from obstetric and gynecological, general, and urological surgeries in 65%, 22%, and 13% of cases, respectively.³ In our study, the incidence of urinary tract injuries during pelvic surgeries was higher in female than male patients and there were 31 (75.61%) patients that had iatrogenic bladder injuries due to in gynecologic surgeries, 6 (14.63%) iatrogenic injuries due to digestive surgeries, and 4 (9.76%) iatrogenic injuries due to endourology surgeries. This suggested that bladder injury was the most common site of urinary tract injuries during gynecologic surgeries.

Furthermore, twenty-two of thirty-one patients who sustained bladder injury during gynecologic surgery had gynecologic cancer as the main indication of surgery, which may cause pelvic adhesion.

Iatrogenic bladder trauma should be detected intraoperatively at the time it occurs. In addition to direct visualization of injured tissue intraoperatively, external bladder traumas may be suspected as urine was found in the operative field, the air in the Foley catheter collection bag, or direct visualization of the Foley catheter. For patient undergoing intraabdominal surgery, the indwelling urethral catheter may be filled while the abdomen is inspected for fluid extravasation from the bladder. Cystoscopy is warranted if bladder injury is suspected after hysterectomies, sling operations (especially via retropubic route), or transvaginal mesh procedures. This is important as bladder injuries may be missed.¹⁰⁻¹¹ In one study 67% of bladder injuries during hysterectomy were not detected until after cystoscopy.¹²

A variety of radiographic methods can be used to diagnose bladder injury. Perioperatively, ultrasound examination is a quick and useful tool to identify bladder volumes and pelvic or abdominal fluid. IVU had been historically utilized for evaluation of bladder injury but has been largely superseded by cross-sectional imaging modalities.¹³ In the perioperative setting, CT cystography has

become the gold standard diagnostic study for clinically suspected iatrogenic bladder injury. In the setting of extraperitoneal injury, cystography may show extravasation of contrast into the pelvis, while intraperitoneal injury may show extravasated contrast outlining bowel loops and filling dependent intraabdominal spaces.¹⁴ In the delayed diagnostic setting following pelvic or intraabdominal surgery, it may be difficult to suspect bladder injury without a broader differential diagnosis, and evaluation of the ureters may be necessary. In that scenario, CT urography may provide superior diagnostic information by allowing for contrast evaluation of the ureters and the bladder.^{11,13}

The timing for injury repairs is somewhat controversial, with some urologists advocating immediate repairs whereas others favor delayed repairs. It has been argued that recognition and repair of injury at the time of urinary tract injury or within a week of the injury allows for better results with fewer complications. In other hand, intraoperatively recognized injuries are usually more easily repaired at the time without the need for a second surgical intervention.^{1,6} In our study, 30 patients (73.17%) underwent immediate intraoperative reconstruction surgeries, whilst the other 11 patients (26.83%) underwent delayed reconstruction surgeries. Patients who underwent delayed reconstructive surgery was those with undetected injury during intraoperative and those who had underwent damage control surgery.

Bladder injuries are managed depending on their location (intraperitoneal or extraperitoneal). The majority of intraperitoneal injuries require immediate operative repair to prevent the development of sepsis. The occasional small intraperitoneal injury without resultant sepsis or ileus may be managed with conservative, nonoperative treatment.²⁻³ The standard repair is a two-layer closure including the mucosa with absorbable suture material. In other hand, extraperitoneal injuries are often treated conservatively by decompression of the bladder with a Foley catheter and observation.^{4,8} However, if other associated injury require surgical repair, it is reasonable to repair an extraperitoneal bladder injury at the same time. Additionally, large extraperitoneal injuries or extraperitoneal injuries in patients that will require orthopedic hardware, such as in pelvic fractures, will benefit from operative repair rather than conservative bladder diversion. In our study, the management were 33 (80.49%) patients underwent

bladder repairs, 1 (2.44%) patient underwent palliative cystectomy, 2 (4.88%) patients underwent damage control surgeries, 3 (7.32%) patients underwent bladder explorations, and 2 (4.88%) patients underwent urethral catheter insertions. The patient who had not underwent bladder repair was patient with bladder trauma AAST grade I and extraperitoneal bladder trauma.

The complication rate of bladder injury was 0.28%. it can cause extravasation of urine, patients may also note worsening abdominal pain, abdominal distension, peritonitis, and may even progress to sepsis if not treated. In our study, there were 3 (7.32%) mortality cases due to prolonged bleeding and sepsis.

CONCLUSION

In our study, iatrogenic bladder trauma mostly affected female patients that underwent gynecologic surgery on the age group of 41-50 years old. Almost all of the cases were treated by bladder repairs. We hope by knowing the epidemiology of iatrogenic bladder injury and perform prompt treatment then we can take precautions to reduce the level of morbidity and mortality.

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