Original Research Article

Characteristics of Ureteral Trauma Following Gynaecological Procedures

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ABSTRACT

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| **Aims:** To find out the incidence of ureteral trauma at Hasan Sadikin Hospital in Bandung with the causes and actions taken  **Study design:** This research is a cross-sectional study.  **Place and Duration of Study:** The research was conducted at Hasan Sadikin Hospital Bandung, West Java. The research was conducted for 18 months, from January 2011 to July 2012.  **Methodology:** This research is descriptive research with a cross-sectional approach. The population in the study were all ureteral trauma sufferers who were diagnosed after experiencing external trauma or were discovered intraoperatively or postoperatively (delayed). The sample in this study was taken using a total sampling technique, where all population members were sampled provided they met predetermined criteria. The number of samples in this study was 15 people. From January 2011 to July 2012, 15 cases of ureteral injuries were recorded. All the patients were women whose ages were between 39 to 56 years  **Results:** Of the 15 cases In 14 (93,33%) of them, the injury was caused during gynecologic surgery. Only 1 case (6,66%) was reported due to external trauma. There was no case of ureteral injury caused by urologic or general surgery procedures. Nephrectomy procedures had been performed in 2 cases (13,33%), whereas the other procedures were ureteroureterostomy in 9 cases (60%), ureteroneosistostomy in 1 case (6,66%) and primary suture in 3 cases (20%).  **Conclusion:** Ureteral trauma is very rare in HSGH, the most common etiology is due to iatrogenic injury after gynecologic procedures. The most common technique performed was ureteroureterostomy.. |

*Keywords: Ureteral trauma, iatrogenic injury, ureterouretrostomy, uretero-neocystostomy, nephrectomy*

1. INTRODUCTION

Injury to the ureters can occur due to external trauma, open surgery, or laparoscopic or endoscopic procedures. Trauma due to external trauma to this organ is rare because of its anatomical location and its easy-to-move nature in the retroperitoneal cavity. Previous research shows that the incidence of ureteral trauma due to external trauma is less than 1% of all urogenital trauma, where injuries due to blunt trauma are 4.1% and penetrating trauma is 5.2%. Most of these are due to gunshot trauma (90.7%)1. Iatrogenic ureteral injury is 52-82% due to gynecological procedures, 5-10% due to urological procedures, and 9% due to general surgical procedures 1,2,3.

The actions taken depend on the location of the injury and the condition of the surrounding organs, including ureteroneocystostomy, vesico-psoas hitch, ureteroureterostomy, primary closure, transureteroureterostomy, and Boari tabularized bladder flap. The complications that occur are diverse and vary in incidence between each report, varying between 0-25%. Known complications include urine leakage, resulting in a urinoma, abscess or peritonitis, and even sepsis 1,2,3,4.Currently, there is no data on ureteral trauma in Indonesia, especially in West Java. Based on the research above, researchers want to know the number of cases and actions that have been carried out on patients who experienced ureteral trauma, especially at Hasan Sadikin Hospital, Bandung.

The research problem in this research is: 1) What is the incidence of ureteral trauma cases in hospitals? Hasan Sadikin Bandung; 2) What are the causes of ureteral trauma at Hasan Sadikin Hospital in Bandung and 3) What operative procedures are performed on ureteral trauma sufferers at Hasan Sadikin Hospital, Bandung

2. material and methods

**2.1. Research Design**

The research carried out is reflective descriptive research with a cross-sectional design. This research was carried out by collecting and analyzing medical record data of patients suffering from ureteral trauma who came to Hasan Sadikin Hospital Bandung, West Java, from January 2011 to July 2012

**2.2. Place and Time of Research**

The research was conducted at Hasan Sadikin Hospital Bandung, West Java. The research was conducted for 18 months, starting from January 2011 to July 2012

**3.3. Research Subjects**

**3.3.1. Population**

The population in this research was all ureteral trauma patients who came to Hasan Sadikin Hospital, Bandung, West Java, from January 2011 to July 2012.

**3.3.2. Sample Size**

The sample study in this research uses a total sampling technique, namely the total population, followed by inclusion criteria, will become the research product. The sample consisted of 15 patient medical records data.

**3.3.3. Inclusion Criteria**

1. Hasan Sadikin Hospital Bandung, West Java which has ureteral trauma complaints.

2. Patients who have complete medical record data.

**3.3.4. Exclusion Criteria**

1. Hasan Sadikin Hospital Bandung, West Java which has no complaints of ureteral trauma.

2. Patients with incomplete medical record data

**3.4. Research Variables**

**1. Variable Dependent**

Dependent variables are related variables that are influenced or result from independen variables. Therefore, the variable dependent in this research is: uterine trauma.

2. Variable Independen

Independent variables are independent variables that change, resulting in the emergence or change of dependent variables. Therefore, the variable variables in this research are age and sex type.

**3.5. Research Instrument**

The research instruments used in this research include medical record records of serial trauma patients at Hasan Sadikin Hospital Bandung, West Java, from January 2011 to July 2012

**3.6. How research works**

The way the research works is by collecting medical record data and supporting examinations retrospectively. The data taken is data on the cause of the trauma or initial diagnosis, and the type of surgery performed to treat the trauma.

3**.7. Data Analysis Methods**

Selling the data obtained will then go through a series of data management processes including data input, grouping, editing, and storage on the computer as well as using the data processing application software, namely SPSS (Statistical Package for Social Science) v.24. After that, an univariate analysis will be carried out to produce the frequency distribution and cell prevalence for each variable. Univariate analysis in this research is data on the cause of trauma or initial diagnosis, and the type of surgery performed to treat the trauma obtained which is presented in the form of number (n) and cell percentage (%).

3. results and discussion

**3.1. Research Result**

Fifteen subjects had been diagnosed with ureteral trauma and were treated during the period from January 2011 to July 2012. All sufferers were women aged between 39-56 years, of which 1 person (6.66%) was due to external trauma and 14 people (93.33%) were due to iatrogenic trauma after undergoing a gynecological procedure. No ureteral trauma resulting from urologic procedures or general surgery was observed during the study period.

**3.1.1. Distribution of Ureteral Trauma Patients Based on Gender**

**Table 1. Distribution of Ureteral Trauma Patients Based on Gender**

|  |  |  |
| --- | --- | --- |
| Gender | Frequency (n) | Percentage (%) |
| Male  Female | 0  15 | 0  100 |
| Total | 15 | 100 |

**3.1.2. Distribution of Ureteral Trauma Patients Based on Age**

**Table 2. Distribution of Ureteral Trauma Patients Based on Gender**

|  |  |  |
| --- | --- | --- |
| Age (year) | Frequency (n) | Percentage (%) |
| 39-43  44-48  49-53  54-59 | 4  6  2  3 | 26.7  40.0  13.3  20.0 |
| Total | 15 | 100 |

**3.1.3. Distribution of Ureteral Trauma Patients Based on Trauma Cause/Procedure**

**Table 3. Distribution of Ureteral Trauma Patients Based on Trauma Cause/Procedure**

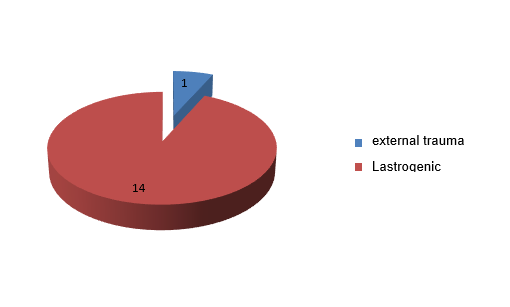
|  |  |  |
| --- | --- | --- |
| Causes of Trauma / Procedures | Frequency (n) | Percentage (%) |
| External trauma | 1 | 6.7 |
| Radical hysterectomy | 1 | 6.7 |
| Hysterectomy | 7 | 46.6 |
| CS | 1 | 6.7 |
| Bilateral Hystero-Salpingo-Oovorectomy | 5 | 33.3 |
| Total | 15 | 100 |

**3.1.4. Distribution of 15 Ureteral Trauma Patients**

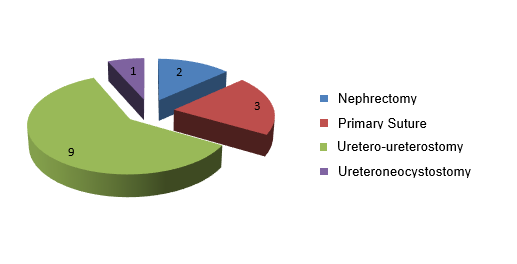
**Table 4. Distribution of 15 Ureteral Trauma Patients Based on Cause, Time, Grading of Ureteral Trauma, and Actions for Ureteral Trauma Patients**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Age** | **Causes of Trauma/Procedure** | **Diagnosis Trauma Ureter (AAST)** | **Diagnosis Time** | **Unilateral (U) / Bilateral (B)** | **Action** |
| 40 | External trauma | 5 | Intra Operative | U | Nefrektomi |
| 40 | Radical hysterectomy | 2 | Intra Operative | U | primary suture |
| 44 | **Hysterectomy** | 4 | Intra Operative | U | Ureteroureterostomi |
| 39 | CS | - | Post Operative | U | Nefrektomi |
| 59 | **Hysterectomy** | 4 | Intra Operative | U | Ureteroureterostomi |
| 45 | Bilateral Hystero-Salpingo-Oovorectomy | 4 | Intra Operative | U | Ureteroureterostomi |
| 47 | **Hysterectomy** | 4 | Intra Operative | U | Ureteroureterostomi |
| 56 | **Hysterectomy**i | 3 | Intra Operative | U | primary suture |
| 47 | Bilateral Hystero-Salpingo-Oovorectomy | 2 | Intra Operative | U | primary suture |
| 52 | Bilateral Hystero-Salpingo-Oovorectomy | 4 | Intra Operative | B | Ureteroureterostomi |
| 47 | Bilateral Hystero-Salpingo-Oovorectomy | 2 | Intra Operative | U | Ureteroureterostomi |
| 42 | **Hysterectomy** | 4 | Intra Operative | U | Ureteroureterostomi |
| 44 | Bilateral Hystero-Salpingo-Oovorectomy | 4 | Intra Operative | U | Ureteroureterostomi |
| 51 | **Hysterectomy** | 3 | Intra Operative | U | Ureteroneosistostomi |
| 56 | **Hysterectomy** | 3 | Intra Operative | U | Ureteroureterostomi |

The diagnosis of trauma was made intraoperatively in 14 patients (93.33%) and 1 person (6.66%) was diagnosed after surgery (delayed). Among trauma caused by gynecological procedures, 1 person (7.14%) experienced trauma after undergoing a radical hysterectomy procedure, 7 people (50%) after undergoing hysterectomy, 5 people (35.71%) after undergoing bilateral Hystero-Salfingo-Oovorectomy, and 1 person (7.14%) after undergoing Sectio Cesarea. The procedures performed were nephrectomy in 2 people (13.33%), ureteroureterostomy in 9 people (60%), ureteroneocystostomy in 1 person (6.66%) and primary suture in 3 people (20%). In diagram form, it is presented in Figure 1 and Figure 2 below:



**Figure 1. Diagram of The Causes of Ureteral Trauma at Hasan Sadikin Hospital**



**Figure 2. Diagram of actions carried out for ureteral trauma at Hasan Sadikin Hospita**l

**Discussion**

The most frequently encountered ureteral trauma at Hasan Sadikin Hospital is iatrogenic, generally after undergoing gynecological procedures. The incidence of ureteral trauma in gynecological surgery is approximately 1.6%. This figure is following that obtained in Taiwan of 1.5% (Alex Wang, 1995)(21), but is slightly different from that proposed by Drake as much as 0.3%(22). This trauma occurs due to the location of the ureter organ which is close to the uterine organ and its adnexa.

Ureteral trauma due to external trauma was only found in 1 case in 18 months, around 0.01% of all cases of accidents caused by motor vehicles. This figure is very small when compared with trauma to the urogenital organs (0.8%) or compared with organs in other systems

4. Conclusion

Ureteral trauma is very rare at Hasan Sadikin Hospital, of all cases, iatrogenic trauma during gynecological procedures is the most common cause of ureteral trauma

Ethical Approval:

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

Consent

As per international standards or university standards, Participants’ written consent has been collected and preserved by the author(s).

Disclaimer (Artificial intelligence)

Option 1:

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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