

## SYSTEMATIC REVIEW OF VULVAR HEMATOMA AFTER CONSENSUAL SEXUAL INTERCOURSE IN ADOLESCENT AND CASE REPORT

### ทบทวนวรรณกรรมเชิงระบบของก้อนเลือดที่อวัยวะสืบพันธุ์ภายหลังเพศสัมพันธ์ของหญิงวัยรุ่นและรายงานผู้ป่วย

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#### Abstract

**Objective:** To discuss the history, injury, and treatment of a case of vulvar hematoma in an adolescent patient who had consensual intercourse and to review the related literatures.

**Study design:** Systematic review of a computer-based search of the English literature from January 1900 to February 2012 with the use of the terms vulvar hematoma, vulvar injury, consensual sex injury, and genital trauma/injury were performed. Causes, presentation, and treatment were discussed and compared with our case. The data for this study was obtained by the examination of contemporaneous notes in Maharaj Nakorn Chiangmai Hospital, Department of Forensic Medicine, Chiangmai University from 2007 to 2011, where the sexual assault patients were examined.

**Results:** The most recent case report about vulvar hematoma was Eleanor et al. in 2009. It is more common in women with severe pelvic or perineal trauma. There were 474 cases of alleged sexual abuse in Maharaj Nakorn Chiangmai Hospital, which were examined from 2007 to 2011. 96% were female and only 4% were male. The most common location of injury was located at posterior fourchette 37.9 % and the most common type of injury was abrasion 65.3%.

**Conclusion:** Vulvar Hematoma was rare. Vulvar hematoma usually resulted from trauma and was unusually spontaneous. The traumatic events causing vulvar hematoma included injuries during child birth, sexual trauma, straddle injury, assault, fall from height, complication of laparoscopic surgery, bicycle accident and cattle horn injury. Early determination of the etiology of vulvar hematoma and proposed treatment must be concerned.

**Keywords:** vulvar, hematoma, genital trauma, sexual intercourse

## บทคัดย่อ

**วัตถุประสงค์:** การศึกษารายละเอียดเรื่อง ประวัติ อาการบาดเจ็บ และการรักษาของก้อนเลือดที่อวัยวะสืบพันธุ์หญิง ในผู้หญิงวัยรุ่นน ภายหลังจากยินยอมมีเพศสัมพันธ์ ทบทวนวรรณกรรมที่มีความสัมพันธ์เกี่ยวข้อง และศึกษาลักษณะของการบาดเจ็บที่พบหลังจากมีเพศสัมพันธ์

**วิธีการศึกษา:** การศึกษาใช้วิธีการทบทวนเชิงระบบโดยใช้คอมพิวเตอร์เพื่อค้นหาวิจัยที่มีรายงานเป็นภาษาอังกฤษ ตั้งแต่เดือนมกราคม ค.ศ. 1900 ถึงกุมภาพันธ์ 2012 โดยใช้คำว่า ก้อนเลือดที่อวัยวะสืบพันธุ์หญิง การบาดเจ็บที่อวัยวะสืบพันธุ์หญิง การบาดเจ็บหลังจากมีเพศสัมพันธ์ และการบาดเจ็บของอวัยวะสืบพันธุ์ โดยนำสาเหตุ อาการ อาการแสดง และ การรักษา มาอภิปราย และเปรียบเทียบกับกรณีศึกษาในรายนี้ และศึกษาเวชระเบียนของผู้ป่วยที่มาทำการตรวจที่โรงพยาบาลมหาราชนครเชียงใหม่และภาควิชานิติเวชศาสตร์ มหาวิทยาลัยเชียงใหม่ ตั้งแต่ปี ค.ศ. 2007 ถึง 2011

**ผลการศึกษา:** กรณีศึกษาของก้อนเลือดที่อวัยวะสืบพันธุ์หญิง พบได้น้อย กรณีศึกษาล่าสุดคือของ Eleanor et al. ในปี ค.ศ. 2009 และ การเกิด ก้อนเลือดที่อวัยวะสืบพันธุ์หญิง โดยมากจะเกิดจาก การบาดเจ็บอย่างรุนแรงที่บริเวณอุ้งเชิงกราน และ บริเวณรอยต่อของอวัยวะสืบพันธุ์และทวาร พบว่ามีผู้ป่วยที่มาด้วยประวัติว่าถูกข่มขืน 474 ตั้งแต่ปี ค.ศ. 2007 ถึง 2011. โดยที่ 96% เป็นเพศหญิงและมีเพียง 4% ที่เป็นเพศชาย บริเวณที่พบว่ามี การบาดเจ็บมากที่สุดคือ โปสที่เรียฟอเช็ต (posterior fourchette) 37.9 % และชนิดของบาดแผลที่พบมากที่สุดคือ บาดแผลถลอก 65.3%

**สรุป:** ก้อนเลือดที่อวัยวะสืบพันธุ์หญิง พบได้ยาก และ ส่วนมากมักเกิดภายหลังการบาดเจ็บ และเกิดขึ้นเองได้น้อย การบาดเจ็บที่ทำให้เกิด ก้อนเลือดที่อวัยวะสืบพันธุ์หญิง ได้แก่ หลังการคลอดบุตร การบาดเจ็บจากการมีเพศสัมพันธ์ การบาดเจ็บจากการกระแทกบริเวณอุ้งเชิงกราน การถูกทำร้าย การตกจากที่สูง ภาวะแทรกซ้อนจากการผ่าตัดโดยใช้กล้อง การบาดเจ็บขณะขี่จักรยาน และ จากการถูกสัตว์ขวิด ส่วนน้อยสามารถเกิดขึ้นได้เอง ซึ่งการวินิจฉัยสาเหตุและการรักษาที่เหมาะสมของก้อนเลือดที่อวัยวะสืบพันธุ์หญิง เป็นสิ่งที่ต้องให้ความสำคัญ

**คำสำคัญ:** อวัยวะสืบพันธุ์หญิง, ก้อนเลือด, การบาดเจ็บที่อวัยวะสืบพันธุ์หญิง, เพศสัมพันธ์

## Introduction

In Chiangmai, there were 82 and 115 reported sexual assault cases in Thailand in 2007 and 2011, respectively. There is an escalating epidemic of sexual assault in Thailand and in other Asian countries. Few rape survivors seek immediate medical attention, even with serious injury.<sup>4</sup> Delayed presentation may result in loss of forensic evidence and delayed treatment for sexually transmitted infections, postexposure prophylaxis for HIV, and emergency contraception, which are maximally effective in case of early treatment<sup>5</sup>. Rape sequelae include illness and increased healthcare utilization<sup>6</sup>. Medical care early after sexual assault may reduce these sequelae<sup>4</sup>.

Genital injury is possible during both consensual and non-consensual sexual intercourse. It can be very difficult to determine the causes of these injuries by only physical examination findings. The sensitive nature of adolescent sexuality may affect a patient's disclosure, especially in an emergency setting or at the time of the initial interview. Nevertheless, the management of vulvar hematoma can be quite different for the two etiologies. Victims of assault will require additional interventions, including police and child protective services reports and counseling services. In contrast, patients injured during consensual intercourse may need reassurance to their own health and well-being after their injuries have been treated. Early determination of the etiology of vulvar hematoma and proposed treatment must be concerned.

### **The case report**

A 14-year-old girl was brought to the Emergency Department (ED) by her parents for large vulvar hematoma. At the first time we interviewed her with her mother, the patient reported that she left school with her 15-year-old boyfriend on the day of admission, and had non-consensual vaginal intercourse for the first time but after disclosure with her mother; she reported that she had consensual vaginal intercourse with her boyfriend. They had sex intercourse at only one time and her boyfriend used condom. According to the information from the patient, she had only vaginal insertion, and denied penetration with additional objects. After that she went home and her vagina became enlarged and painful but there was no bleeding from her vagina.

She was presented to the Emergency Department (ED) 5 hours after she had a sexual intercourse. At the Emergency Department (ED), the patient's vital signs were stable, with a temperature of 36.7° C (98°F), pulse of 88 beats/min, respiratory rate of 18 breaths/min, and a blood pressure of 98/75 mm Hg. Abdominal examination was normal. Pelvic examination revealed hematoma at Right labia majora and labia minora size 6.5 x 10.3 centimeter (picture 1), which looked tense and markedly tender. This hematoma obliterated vaginal canal and hymen could not be evaluated. Left labia majora was normal. Forensic evidence was collected and sent for crime lab analysis. She reported her menarche at age of 12; her last menstruation was 2 weeks ago and lasted approximately 5 days. She denied history of heavy menstruation. Laboratory evaluation was determined for a hemoglobin of 12 g/dL, platelet count of 264,000/L, INR of 1.24, and PTT of 36.5 sec.

The patient was also examined by the obstetrics-gynecology doctor and social workers. The patient underwent the surgery to evacuate and remove blood clot from the hematoma at 3 hours after admission. After surgery, the hematoma was resolved and patient was discharged from the hospital at 6th days after admission. The patient was also received necessary vaccinations and antibiotics.



Picture 1 : hematoma at Right labia majora and labia minora size 6.5 x 10.3 centimeter

## Study design

Systematic review of a computer-based search was performed to the English literatures from 1900 to 2012 with the search terms of vulvar hematoma, vulvar injury, consensual sex injury, and genital trauma/injury. Moreover, the reviews for risk factors, underlying causes, groups at risk, initial complaints, diagnostic features, and the treatment were also included. Findings were discussed and compared with our cases.

Totally, 154 abstracts were evaluated based on the search results and 15 sources were selected in the final literature reviews. 5 papers<sup>17,19,20,21,22</sup> were about vulvar hematoma and 10 papers<sup>11,12,13,15,16,23,24,25,26</sup> were about genital injury.

The data for this study were obtained by the examination of contemporaneous notes made by the Department of Forensic Medicine, Chiangmai University from 2007 to 2011, where the sexual assault patients were examined. In all cases, photographic evidence was collected with consent in case of genital injuries. There were 482 consecutive cases of alleged sexual abuse but 474 cases were included due to consent to body and genital examination. Injuries were documented on diagrams. Genital examination, using speculum, was in supine position.

## Results

### VULVAR HEMATOMA

Vulvar Hematoma was rare. There was no literature review about vulvar hematoma before ours. The most recent case report about vulvar hematoma was Eleanor et al.<sup>20</sup> in 2009. They reported a case of 28 years old woman presented with vulvar hematoma because of spontaneous rupture of internal iliac artery. Another case report about vulvar hematoma was Jennifer et al.<sup>21</sup> in 2005. They reported a case of 16 years old woman who failed on top of the bed railing. After thorough examination, her coagulopathy panel revealed prothrombin time of 14.9 seconds (9–13 normal) and activated partial thromboplastin time of 50 seconds (25–35 normal). Virgili et al.<sup>22</sup> also reported a case of vulvar hematoma of 18 years old woman after bicycle accident.

Source	Injury	Cause of injury	Predisposing Factors	Treatment	Outcome
Chiangmai university	vulvar hematoma	Consensual sexual intercourse	First time intercourse lack of co-operation inexperience partner failure lubrication	Evacuation of the hematoma Collect forensic evidence	Resolve without any complication
Narayan et al. [17]	vulvar hematoma	injuries from a fall from height, straddle type trauma, bicycle accidents, cattle horn injury	No	Evacuation of the hematoma	Resolve without any complication
Eleanor et al.[20]	vulvar hematoma	spontaneous rupture of internal illiact artery	spinal cord injury with intermittent self-catheterization	Evacuation of the hematoma	Resolve without any complication
Jennifer et al.[21]	vulvar hematoma	falling on top of the bed railing	coagulopathy due to systemic Rickettsial infection	Conservative treatment	Resolve without any complication
Sarah et al.[26]	of vaginal laceration	consensual inter cause	First time intercourse (3 of 4 Cases)  inexperience partner	Surgery to stop bleeding	Resolve without any complication

Table 1 Comparison of our case and other studies

Vulvar hematoma usually resulted from trauma but rare case was spontaneous<sup>21</sup>. The trauma events causing vulvar hematoma included injuries after child birth, sexual trauma<sup>23</sup>, straddle injury, assault, fall form high<sup>17</sup>, complication of laparoscopic surgery<sup>22</sup>, bicycle accident<sup>21</sup> and cattle horn injury<sup>20</sup>. The risk factors of vulvar hematoma were coagulopathy, rough coitus, vaginal instrumentation

during sexual experimentation, adolescent age, severe injury<sup>5,10,16</sup>, delivered LGA child ,surgery or radiation<sup>17,20,21</sup>.

Treatment of vulvar hematoma was somewhat controversial. Firstly, the patient must be adequately resuscitated. The hematoma itself may be managed by conservative treatment, surgery, or selective arterial embolization. Small hematomas can be managed by conservative treatment but exact criteria for either conservative treatment or surgery have not been established. It is generally accepted that if it is significantly large or expanding, intervention is required.<sup>21,22,24</sup> Some authors advocated conservative treatment if the hematoma size is less than 3 cm.<sup>18,19</sup>

## SEXUAL ASSAULT IN CHIANGMAI

There was 474 cases of alleged sexual abuse, between 2007 and 2011 at the Department of Forensic Medicine, Chiangmai University. The alleged sexual abuse cases were 82, 85 , 87 ,105 and 115 respectively, 455 cases (96 %) were female and 19 cases (4%) were male. Age ranged from 2 months to 52 years.

The alleged sexual abuse cases tended to increase year by year. More than half of the cases were 11-20 years of age (303/474, 63.9%), there were 68/474 cases (14.3%) in age 1-10 years old; age 21-30 were 15.4 % (73/474); age 31-40 and 41-50 years were 3.6 and 2.1 %, respectively (17/474, 10/474). Only 0.6 % (3/474) was 51 to 60 years old. Most patients (469 cases or 99.9%) were Asian and only 5 cases (0.1 %) were Caucasoid.

More than one third (179/474, 37.8%) of the alleged sexual abuse cases sustained anogenital injuries. Nearly a quarter (120/474, 25.3%) of cases presented to the Emergency Department (ED) with blunt force injuries (elsewhere other than anogenital areas). Figure 1 showed age and frequency of anogenital injuries. Age group 1-10 years had the highest rate of anogenital injuries and the most common location of injury in this age group was labia (15/33, 45.5%) followed by hymen (11/33, 33.3%). 33.9 % of age 11-20 years old and 59.2% of 21-30 years old sustained anogenital injuries (112/303 and 27/73 respectively) and the most common location of injury in this group was posterior fourchette (39.3% of 11-20 years old and 59.2 % of 21-30 years old).

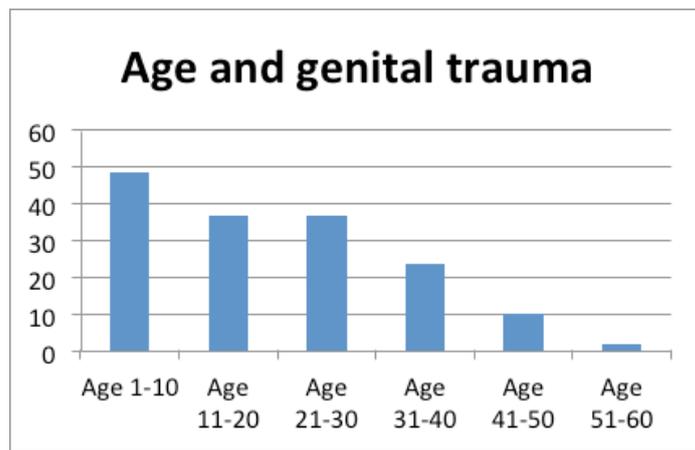


Figure 1 . shown relation of age and genital trauma

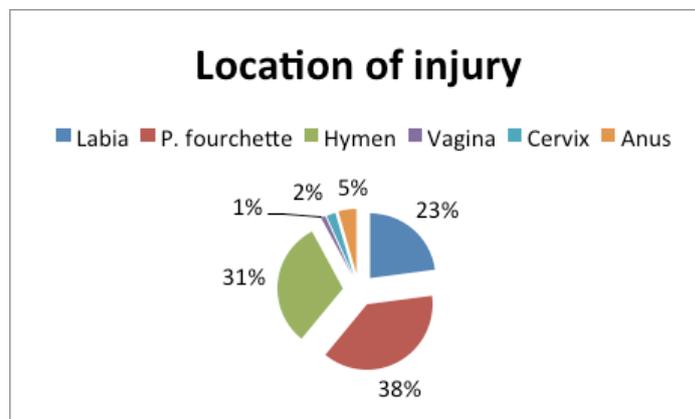


Figure 2. Shown the location of genital injury and frequency of each area

Figure 2 showed the most common location of genital injury which was posterior fourchette ( 68/197 , 37.9%), followed by hymen (31/179, 17.3 %) and labia (23/179, 12.8%). Only 2 cases (1.1%) were presented with vaginal injuries. Figure 3 showed the difference of injury types. Abrasion was the most common injury which sustained in alleged sexual abuse cases 65.3%(117/179) followed by laceration 21.8% (39/179). Contusion was about half as many as laceration at 12.3% (22/179) of injured cases. Only 1 case was presented with hematoma.

Male anogenital injuries were presented in 42.1 % (8/19) of male cases. Anus was the only one location found in Male. Abrasion was the most common injury at anal region including 4 of 8 cases followed by laceration and contusion (3 and 1 cases), respectively. 78.9% (15/19) of male cases were at 11-20 years of age. 15.8% and 5.3 % were at age 1-10 and 31-40 years respectively. Nearly a quarter of cases (21.1%) were attacked by stranger. But 79.9 % were attacked but persons who were known such as friends, acquaintance and parents. Only 1 case was examined before 11 hours after attacked. But 84.2 % were examined later than 48 hours after intercourse. The rest 10.5% (2/19 cases) were examined between 24-35 hours

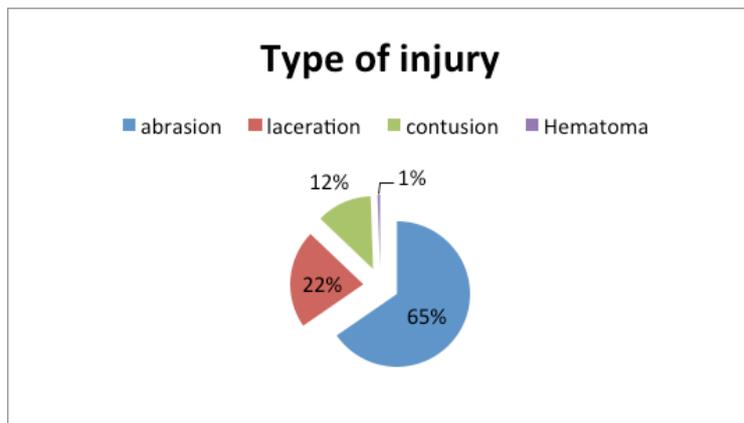


Figure 3. Shown the type of genital injury and frequency of the injury

## Discussion and conclusion

When this case was compared with the case form Eleanor et al.<sup>20</sup>, our case had vulvar hematoma due to sexual intercourse, and vascular injuries were not found. Instead, the hematoma in the case of Eleanor et al.<sup>20</sup> was caused by spontaneous rupture of internal iliac artery. The symptoms of both cases were similar including abdominal, groin, and buttock pain, with urologic symptoms. Treatments in both cases were evacuation of the hematoma but forensic evidence was to be collected in our cases also.

Narayan et al.<sup>17</sup>, studying about female genital injuries in India, found that vulvar hematomas were found in 15 women (42.9%) who sustained the injuries from fall from height, straddle type trauma, bicycle accidents, or as a result of a cattle horn injury but vulvar hematomas were not caused by sexual intercourse. Comparing to our case, the vulvar hematoma in Narayan study caused by severe trauma at pelvic area and perineum. In Narayan study, the coital injuries did not cause vulvar hematoma but caused vaginal bleeding and most of cases were injured during the first intercourse that were similar to our case injured at first intercourse but our case had vulvar hematoma. This might result from the fact that our case did not well co-operated with her partner and her partner had first intercourse too, so he would apply force at her vulvar instead of her vagina and failure of vaginal lubrication might cause more severe injury.

Sarah et al.<sup>26</sup> presented 4 case of vaginal laceration after consensual intercourse, 3 of them had the first intercourse. Similar to our case injured at the first intercourse and lacked of co-operation, inexperienced partner and failure of lubrication made the intercourse more harder to perform and much more force had to be applied to perform the intercourse and this force might be enough to cause the injuries in both our case and their cases.

Bowyer and Dalton<sup>15</sup> found that a minority of vaginal rape survivors in their study had genital injuries (22/83; 26%). This led them to conclude that “absence of genital injuries did not exclude [vaginal] rape”<sup>15</sup>. This was the same as our conclusion that 61.2 % of rape cases did not have genital injury. In addition, 36.0 % of consensual intercourse in our study had genital injuries.

The alleged sexual abuse cases increased year by year. The most common site of injury was posterior fourchette 37.9% and the most common type of injury was abrasion (65.3%). This finding matched Iain et al.<sup>16</sup> finding that the most common site of injury was posterior fourchette (13.8%) and the most common type of injury was abrasion (10%). Unlike Iain<sup>16</sup> study, about half our cases (217/474 45.8%) sought for medical service after 48 hours after the assault; only 25.1% came to hospital before 11 hours after the incident. Comparing to Iain<sup>16</sup> study, only 7.4% (37/500) sought for medical services after 48 hour but 62.2% (311/500) came to hospital before 11 hours. In our study, the patients were younger than Iain [16] study and our study included patients who were less than 15 years old. This might made our patients be afraid to tell their parents about their sexual activity. Moreover, Thai culture made them thought that being raped was the shameful event and should not disclose to anyone. In men group, most of the patients sought for medical services after 48 hours (84.2% 16/19).

The incidence of genital injury following an intercourse varied greatly between different studies using various methodologies. For example, by using visualization only, and those using a staining dye, definition of injuries also varied between studies using colposcopy. And there was only a few studies about injury after consensual intercourse.

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