

Critically appraised topic: Inner thigh bruises

Author: Jane Brabin

Clinical forensic question (using the PICO framework)

In patients, aged 14 and over, presenting with inner thigh bruising (P), who are examined in a health setting (I), what proportion of inner thigh bruises can be attributed to an accident (C), compared to the proportion attributed to an assaultive injury (O)?

Background

Bruising to the inner thigh is a non-genital injury seen following sexual assault. The mechanism of injury is blunt-force trauma causing bleeding beneath the skin and may be associated with a history of resistance to genital penetration or with reported physical restraint. The patient may report tenderness or may be unaware of the presence of the bruises.

Bruises to the inner thigh can also be the result of accidental injury and the patient may be able to provide a history of how the injury occurred. However in general, accidental bruises tend to occur on exposed surfaces over bony prominences. Fingertip-patterned bruises can occur on the inner thighs and are more forensically informative than non-patterned bruises.

Databases searched

PubMed, Google Scholar, Ovid

Search terms

“Inner thigh bruises”, “non-genital injury”, “injury interpretation”, “skin injury patterns” AND “sexual assault”, “accidental”. Initial searches for “inner thigh bruises” did not yield any results, so search terms broadened.

Inclusion/exclusion criteria

“Paediatric” and “children” were terms excluded during the search. Papers were studied and included if there was specific mention of inner thigh bruises. Reference lists of included articles were studied to obtain possible additional relevant references. A forensic textbook and sexual assault atlas were studied in order to include expert consensus opinion on the topic.

Synthesis of results

One literature review article, two clinical guidelines, a clinical forensic textbook and sexual assault atlas all describe inner thigh bruises in the sexual assault setting. There was no comparative literature addressing accidental inner thigh bruises.

Forensic evidence statements

- The consensus opinion of experts, supported by scientific first principles and observations from clinical experience, is: that inner thigh bruising is an injury that is observed in complainants of sexual assault.
- Inner thigh bruising may also have an accidental cause
- The inner thigh is reasonably protected from accidental injury compared with the outer, more exposed parts of the leg⁴
- Fingertip patterned bruises can be seen on the inner thigh following grasping or grabbing.^{2,3,4}

Limitations and Discussion

Given the paucity of data, no firm conclusion can be drawn regarding inner thigh bruise causation and it is not possible to answer the clinical forensic question:

“in patients, aged 14 and over, presenting with inner thigh bruising, who are examined in a health setting, what proportion of inner thigh bruises can be attributed to an accident, compared to the proportion attributed to an assaultive injury?”

The lack of data available on the incidence of accidental versus assaultive inner thigh bruises identified in a health setting may have the following explanations:

- Most inner thigh bruises that occur either in isolation, or with other injuries, are unlikely to require medical attention due to their benign clinical course
- The inner thigh is a specific anatomical location, which has not been the subject of research outside the field of clinical forensic medicine
- Inner thigh bruises assessed in a forensic setting may not have a corroborated mechanism of causation.

Level of evidence (see appendix A)

Using the evidence hierarchy outlined below the strength of the evidence supporting these findings is level 4 and 5 (based on the NHMRC evidence hierarchy: designation of levels of evidence for an aetiology research question)

Review

Review date	28.05.2021
Reviewed by	NSW Health Education Centre against violence training committee: Dr Carol Stevenson, Dr Ellie Freedman, Dr Paul Hotton, Dr Jane Brabin, Joanne Phillips RN, Dr Anousha Victoire
Are the forensic evidence statements supported by the review group?	Yes
Was there any dissent?	No

Reference	Population	Study Design	Intervention	Comparison	Methodology	Outcomes	Limitations
Song 2017¹	Females experiencing non-consensual sex	Literature review	Injury types, patterns, distribution and associations summarised from the published literature on consensual and non-consensual sex	Injuries sustained during consensual sex summarised	Literature search for articles addressing injury during consensual and non-consensual sex	Extragenital injuries are commonly found on the extremities, with one article reporting that 24% of non-genital injuries occurred on the inner thighs	Inner thigh bruises were not clearly defined, and rates of inner thigh bruises sustained during consensual sex were not reported
Crane 2013²	Victims of sexual assault	Published, peer reviewed guidance				Fingertip bruising may be seen on the inner sides of the thighs when the legs are firmly grasped in an attempt to forcibly open the legs for access to the genitalia	Alternative possibility of accidental inner thigh bruising not addressed
WHO 2003³	Adult victims of sexual assault	Clinical guideline			WHO guidelines are subjected to rigorous quality assurance procedures conducted by the Guidelines Review Committee	Assaultive injury patterns include: injuries following “grasping” – possible fingertip bruises to medial aspect of upper arms, forearms and medial thighs	
Stark 2020⁴	People assessed in the clinical forensic setting	Textbook				Fingertip bruising can be seen over the inner upper aspect of the thighs – generally caused by pressure from grasping, prodding,	

						<p>poking, or knuckle impact.</p> <p>Accidental bruising over the inner upper thigh is less common because of the relatively protected nature of this site</p>	
Faugno 2016⁵	Victims of sexual assault	Atlas				Photographic examples provided of upper inner thigh bruises sustained during sexual assault	

Reference List

1. Song SH, Fernandes JR. Comparison of injury patterns in consensual and nonconsensual sex: is it possible to determine if consent was given? Academic Forensic Pathology [Internet]. Dec 2017 [cited Dec 2020]; 279:112-120. Available from: [doi: 10.23907/2017.052](https://doi.org/10.23907/2017.052)
2. Crane J. Interpretation of non-genital injuries in sexual assault. Best Practice and Research Clinical Obstetrics and Gynaecology [Internet]. 2013 [cited Nov 2020]; 27:103-111. Available from: <http://dx.doi.org/10.1016/j.bpobgyn.2012.08.009>
3. Payne-James JJ, Stark MM, Nittis M, Sheasby DR. Ch 4: Injury assessment, Documentation, and Interpretation. In Stark MM, editor. Clinical Forensic Medicine. 4th Edition. [eBook]; London: Springer; 2020. p214-289.
4. World Health Organisation. Guidelines for medico-legal care for victims of sexual violence [Internet]. Geneva: WHO; 2003 [cited Nov 2020]. p 52. Available from: https://www.who.int/violence_injury_prevention/resources/publications/en/guidelines_chap4.pdf
5. Faugno DK, Spencer MJ, Giardino AP. Physical Examinations of Sexual Assault – Pocket Atlas, Vol 1: Assault Histories. [eBook]; Saint Louis, Missouri: STM Learning Inc; 2016. Loc 1654, 1712, 1899.

Appendix A

Level of research evidence

Level	
I	A systematic review of level II studies
II	A prospective cohort study
III-1	All or none
III-2	A retrospective cohort study
III-3	A case-control study
IV	A cross-sectional study or case series
V	Expert opinion, consensus or guidance published in a) reputable textbooks b) peer-reviewed published literature
VI	Observations based on examiners own clinical experience
VII	Theories developed from scientific first principles