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Radiographic imaging use for lacerations: A necessity or over-imaging?

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ABSTRACT

Introduction: Lacerations are a common cause for individuals seeking care in Emergency Departments. Radiographs are commonly the first imaging modality used when foreign bodies (FBs) or fractures are suspected. However, the effectiveness of radiographs for assessing different laceration presentations remains unexplored, with no standardised practices or guidelines available. This paper aims to investigate the diagnostic yield of radiographic imaging for different laceration presentations.
Methods: A retrospective cross-sectional study design was employed to analyse data of patients who presented for radiographs where lacerations have been mentioned in the referral. Data was collected from two hospitals over a 12-month period. Key variables collected included anatomical region, mechanism of injury, clinical question, and imaging findings. Pearson's Chi–Square test was to assess the distribution of imaging outcomes.
Results: In total, 10 % ($n = 90/869$) of radiographs performed for lacerations showed a positive or new abnormal finding, and 7 % ($n = 61/869$) of radiographs showed suspicious or inconclusive findings. Radiographs were commonly used to assess for fractures and FBs, which were found in 7 % ($n = 59/869$) and 3 % ($n = 28/869$) of patients, respectively. However, there were more inconclusive or suspected findings of FBs than confirmed cases. Request forms with no clear mechanism of injury ($n = 316$) had the lowest proportion of clinically significant findings.
Conclusion: Radiographs have a relatively low diagnostic yield for lacerations, suggesting the need for sufficient physical examination prior to imaging and alignment between clinical judgment and imaging necessity.
Implications for practice: The findings highlight the need for a cautious approach in radiographic utilisation, acknowledging its effectiveness in detecting fractures in injury presentations while understanding its limitations in foreign body detection.

Introduction

Lacerations are the most prevalent hand and wrist injuries in Australia.[1,2] Lacerations are a type of acute wound injury and refers to a traumatic disruption of the skin integrity, which may involve a cut or tear in the underlying tissues.[3,4] In the USA, lacerations account for 8 % of Emergency Department (ED) visits.[5,6] In Australia, it has been estimated that 31 % of hand and wrist ED presentations are due to lacerations.[1,2] Different mechanisms can lead to lacerations. These may include punctures caused by sharp objects, which increases the risks of infection, foreign body (FB) retention, and damage to underlying structures.[7] Lacerations can also result from other mechanisms such as sharp objects, blunt trauma, and bites, which can lead to different severity of injury, from superficial soft tissue to open fractures caused by high-energy trauma.[8] Lacerations from sharp-edged objects, such as knives or glass, are typically clean with minimal tissue loss, but may extend deeply, damaging muscles, nerves, or arteries.[7] In contrast, blunt trauma can lead to fractures and skin tears, increasing infection risks.[7] Bite injuries are highly prone to complications, including vascular damage, blunt or penetrating trauma, and infections and may cause fractures.[7,9] Therefore, tailored approaches for medical history assessment and thorough

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physical and clinical examinations are crucial for managing lacerations effectively.[10]

Radiographs are the primary imaging choice for laceration evaluation in the ED due to their accessibility, low cost, low radiation dose, and prompt reporting.[11,12] Radiographs provide opportunities for physicians to assess bone injuries and localise FBs.[12] The visibility of FBs on radiographic imaging is influenced by the atomic number and density of the objects, and X-ray beam attenuation. Due to the higher atomic numbers and density of many FBs, they appear radiopaque on radiographs leading to improved visibility.[13] Additionally, plain radiographs have been shown to have 62 % sensitivity in detecting FBs in a gelatine gel phantom study.[14] Metal FBs, being dense, are the most easily visualised[15] while glass and wood are less visible on radiographs with limited demarcation.[16,17] It should be noted that these studies were conducted in controlled settings using cadavers where the location of the FBs was known.[15,18] However, in clinical scenarios, patients with lacerations may or may not have FBs, and the location may be uncertain, complicating detection.[18] For instance, Ingraham et al. (2015) found that fish bones are generally visible radiographs, but the sensitivity was only 42 % in emergency settings.[18,19]

The necessity of radiographic imaging depends on wound depth where deeper wounds are harder to explore and may benefit from imaging.[16] However, a study reported that 90 % of wounds were able to be examined and explored adequately clinically, and the overall percentage of detected FBs was low.[16] The sensitivity of radiographic imaging for FB detection also varies by location. 60 % of undetected FBs were in the forefoot, likely because FBs were near bones, obscuring detection.[21] The thin soft tissue layers of the foot can cause superficial FBs near bones to be overlooked, and its complex bone structure can obscure FBs.[20,22] Apart from FBs, lacerations may involve bone injuries or fractures.[23] In facial injuries, about one-third of 1960 maxillofacial fracture cases had facial lacerations, often from motor vehicle accidents and falls.[24] Whilst facial lacerations were found to be associated with fractures, only 7 % of ankle laceration cases demonstrated features of fractures on radiographs.[23] However, patients with skin tears or bite injuries who received radiographic imaging often reported no signs of fracture,[23] suggesting that the need for imaging for lacerations may depend on the initial mechanism.

Imaging guidelines for lacerations focus mostly on the paediatric population, and their recommendations vary depending on the mechanism of the laceration.[17,25] The Ottawa Ankle Rules widely used in ED and the Royal Australian and New Zealand College of Radiologists (RANZCR) do not recommend routine radiographic imaging for superficial wounds[26,27]; however, there is widespread use of radiographs for assessing all lacerations, even though the justification, diagnostic efficacy, and potential overuse are unclear. Therefore, this study aims to assess the diagnostic yield of radiographic imaging in patients with lacerations, focusing on all body regions and providing updated data on the frequency and context in which radiographs are used for laceration presentations.

Methods

A retrospective cross-sectional study design was employed to assess the diagnostic yield of radiographic imaging for lacerations. All patients who presented with lacerations to the imaging departments of two Sydney metro hospitals over a one-year period were considered eligible for inclusion. There were no restrictions on age. Patients were included if there was any mention of 'lacerations' in the clinical history on their imaging request form and received radiographic imaging as part of their care. Patients whose lacerations were not in the region covered by the radiographs or region requested were excluded. Patients were also excluded if lacerations were noted only in the radiology report without corresponding documentation in the clinical history or if the imaging was a follow-up to a laceration presentation rather than an initial radiograph taken in the acute setting.

Data were extracted from the Radiology Information Systems (RIS) of the two hospitals. Data extracted included imaging requests (clinical history, region requested), patient demographics (gender, age), and radiology reports. The keyword “laceration” was used to filter cases within the “clinical history” and “report” fields to identify the target sample. Data were stored on the Research Electronic Data Capture (REDCap) platform, ensuring all information was anonymised to protect participant confidentiality.

The clinical history from the imaging request forms was used to obtain information on the anatomical site, clinical question, and mechanism of injury. The anatomical sites were further grouped into three broad categories: upper limb, lower limb, and axial body. Clinical questions were categorised into four groups based on what the referring practitioner was looking for: suspected fracture, FB, other concerns (e.g. infection, vascular injury, nerve injury), and unspecified. Unspecified meant that there was no clinical question mentioned in the imaging request form. Some laceration presentations were associated with additional injuries that warranted imaging based on separate clinical criteria (e.g. suspected fractures). To account for this, distinctions were made based on the mechanism of injury into four distinct types: traumatic injury, cut, double injury, and laceration, with detailed descriptions provided in Table 1.

Final reports from the radiologists were used to establish imaging findings, and these findings were grouped into four categories: new finding, possible finding, other finding, and no finding. Detailed explanations of these categories are provided in Table 2. The pathologies identified from the imaging reports of the “new” and “possible” finding groups were categorised into fracture, FBs and other (e.g. joint involvement, tendon or ligament involvement).

Data analysis

Descriptive statistics were used to summarise the demographic characteristics of the study population and present the distribution of the study variables. Continuous variables (e.g. age) were reported as range and mean $\pm$ standard deviation. Categorical variables (e.g. gender, mechanism of injury) were presented as frequencies and percentages.

The data were analysed using IBM SPSS Statistics version 28. Pearson's Chi–Square test was used to compare differences in the distribution of categorical variables, including mechanism of injury, radiological finding, and anatomical region. The Chi–Square test was also used to determine whether the proportions of injury types (e.g. cut, traumatic injury) differed significantly across anatomical regions (upper limb, lower limb), and whether the distribution of radiological findings (e.g. new finding, other finding) varied across both anatomical regions and injury types. A p-value of less than 0.05 was considered statistically significant.

The axial region was excluded from analyses involving anatomical regions, as the sample size was limited to 10 cases, resulting in expected cell frequencies below five. For radiological findings, the “possible finding” category was combined with the “new finding” category whenever the expected frequency for “possible finding” fell below five. These adjustments were made to meet the Chi–Square test assumption that all expected cell frequencies be at least five.

Table 1
Mechanism of injury categories.

Mechanism of Injury	Description
Traumatic injury	Standard trauma related injuries, such as crush injuries (e.g., finger caught in a door) resulting in a laceration.
Cut	Injuries resulting from sharp objects, such as broken glass or knives, causing a cut.
Double injury	Combination of a traumatic injury and a cut, such as falling through glass.
Laceration	No specific clinical history provided other than a “laceration”, with no details on the cause.

Table 2
Imaging report finding categories.

Report Finding	Subcategories
No finding	No abnormality or new finding found.
Other finding	Soft tissue laceration, soft tissue gas, swelling, osteoarthritis, bony spur, old injury, previous surgery, vascular calcification, and others.
Possible finding	Suspected fracture, suspected foreign body, suspected tendon or ligament injury.
New finding	Fracture, foreign body, dislocation, tendon or ligament injury.

Results

In total, 1044 patient records were collected, and 869 laceration related radiographic cases met the inclusion criteria. Patients were aged between two to 97 years (Mean: 41.5 ± 21.5 years). Almost half of the patients ($n = 392/869$) were between 20 and 40 years old. The number of male patients ($n = 581/869$) was double the number of female patients ($n = 288/869$).

Clinical history

The anatomical sites examined in the sample were categorised into 19 groups based on the clinical history provided (see Fig. 1). Finger and hand imaging requests accounted for most of the cases, constituting more than half of the sample ($n = 530/869$). There was only one case each for lateral airways, chest, shoulder, orbits and hip. The upper limbs accounted for the most cases ($n = 643/869$), nearly three times more frequent than the lower limbs ($n = 216/869$). The axial body region exhibited the lowest frequency, comprising only 10 cases in total.

The most frequent clinical questions queried were regarding the retention of FBs ($n = 275/869$), and queries related to fracture assessment ($n = 275/869$). Of the cases reviewed, 40 % ($n = 346/869$) involved a single clinical question, while 14 % ($n = 120/869$) cases involved multiple clinical questions. Approximately half of the cases ($n = 403/869$) did not include any clinical questions. Table 3 provides a comprehensive overview of the clinical questions across all cases.

Mechanisms of injury

In the analysis of injury mechanisms (Table 4), for the upper limb region, laceration ($n = 252/643$) and cut ($n = 249/643$) injuries were the dominant mechanisms of injury. In contrast, the lower limb region was primarily affected by traumatic injuries ($n = 83/216$), with cuts ($n = 66/216$) and lacerations ($n = 60/216$) being the subsequent mechanisms. These differences in injury mechanisms for upper and lower limb were significantly different ($\chi 2$ (3, $n = 859) = 48.641$, $p < 0.001$).

Radiological findings

Among the total eligible cases, “no finding” ($n = 371/869$) and “other finding” ($n = 347/869$) were reported with nearly equal frequency and accounted for most of the findings (Table 4). Multiple “other findings” were identified and included soft tissue lacerations (50 %, $n = 174/347$), swelling (31 %, $n = 109/347$), and osteoarthritis (12 %, $n = 31/347$). “New finding” accounted for only 10 % ($n = 90/869$) of the findings.

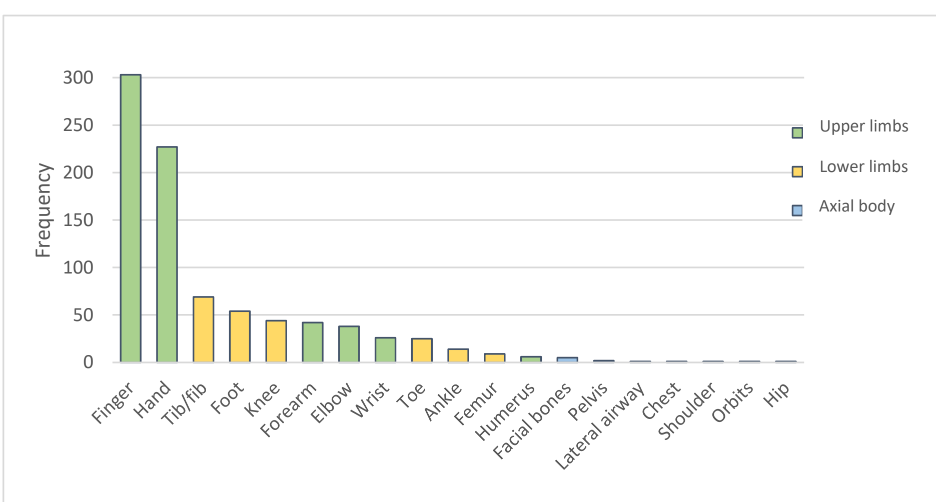

Figure 1. Distribution of anatomical regions ($n = 869$).

Table 3
Clinical questions overview ($n = 869$).

	Clinical Questions				
	? Fracture	? Foreign body	? Other issues	n/a	Count by row
	✓	×	×	×	164 (18.9 %)
	×	✓	×	×	163 (18.8 %)
	×	×	✓	×	19 (2.2 %)
	×	×	×	✓	403 (46.4 %)
	✓	✓	×	×	103 (11.9 %)
	✓	×	✓	×	8 (0.9 %)
	×	✓	✓	×	9 (1.0 %)
Count by column	275 (31.6 %)	275 (31.6 %)	36 (4.1 %)	403 (46.4 %)	869 (100 %)

Table 4
Injury mechanisms and report findings categorised by regional anatomy ($n = 869$).

		Upper limb	Lower limb	Axial body	Total
Mechanism of injury	Cut	249 (38.7 %)	66 (30.6 %)	2 (20.0 %)	317 (36.5 %)
	Laceration	252 (39.2 %)	60 (27.8 %)	4 (40.0 %)	316 (36.4 %)
	Traumatic injury	103 (16.0 %)	83 (38.4 %)	4 (40.0 %)	190 (21.9 %)
	Double injury	39 (6.1 %)	7 (3.2 %)	0 (0.0 %)	46 (5.3 %)
	Total	643	216	10	869
Report findings	New finding	66 (10.3 %)	22 (10.2 %)	2 (20.0 %)	90 (10.4 %)
	Possible finding	49 (7.6 %)	12 (5.6 %)	0 (0.0 %)	61 (7.0 %)
	Other finding	245 (38.1 %)	100 (46.3 %)	2 (20.0 %)	347 (39.9 %)
	No finding	283 (44.0 %)	82 (38.0 %)	6 (60.0 %)	371 (42.7 %)
	Total	643	216	10	869

The proportions of radiological finding categories between the upper and lower limbs were comparable (Table 4). For instance, the "new finding" category was observed in 10 % ($n = 66/643$) of upper limb cases and 10 % ($n = 22/216$) of lower limb cases ($\chi 2$ (3, $n = 859$) $= 5.067$, $p = 0.167$). In contrast, the proportions of "new finding" in the axial body region was slightly higher (20 %, $n = 2/10$).

Across the different mechanisms of injury, the rates of "no finding" ranged from 35 % ($n = 16/46$) (double injury) to 47 % ($n = 149/316$) (laceration). For all four mechanisms of injury, the rates of "new finding" within each category ranged from 7 % ($n = 21/316$) (laceration) to 17 % ($n = 33/190$) (traumatic injury), but there was no significant association between the mechanism of injury and the report finding ($\chi 2$ (6, $n = 869$) $= 9.467$, $p = 0.149$). A detailed illustration of the distribution of radiological findings based on the mechanisms of injury is shown in Fig. 2.

Overall, "new findings" where most common due to traumatic injury (37 %, $n = 33/90$) and cuts (36 %, $n = 32/90$). However, "possible findings" were most common after presentations due to lacerations (38 %, $n = 23/61$) and cuts (38 %, $n = 23/61$) alone. The analysis of the "new finding" and "possible finding" categories revealed three primary pathologies: fracture, FB, and other pathologies such as joint, ligament, or tendon involvement (Fig. 3). In the "new finding" group, a total of 59 cases of fractures, 28 cases involving FBs, and four cases of other pathologies were identified. For injuries categorised as cut, laceration and double injury, the incidence of fractures and FBs was almost evenly distributed but fractures were more common in traumatic injuries than the other presentations.

In the "possible finding" group, there were 19 cases of suspected fractures, 38 possible FBs, and six cases of other potential pathologies. There were much higher proportions of suspected FBs than suspected fractures in all categories except presentations after traumatic injuries. Compared to new findings, there was a higher frequency of suspected FBs than actual detected FBs.

Notably, within the "new finding" category, one case related to a traumatic injury presentation involved both a fracture and a FB, leading to a total of 91 identified pathologies for 90 patients. Similarly, in the "possible finding" category, while there were 61 patients, two cases were identified with the potential presence of both a fracture and a FB.

A total of 275 patients were examined for fractures but only 22 of those cases had confirmed fractures (8 %, $n = 22/275$); for all patients it was 7 % ($n = 59/869$). FBs were queried in 275 cases but identified in only 13 cases (5 %) while the total overall was 3 % ($n = 28/869$). Among the identified FBs, twelve were metallic objects, seven glass fragments, four rocks, one oyster shell, and four remained unknown. For patients that had other queried clinical concerns ($n = 36$), none had tendon injuries, dislocations, or osteomyelitis. However, across all participants there was 0.5 % ($n = 4/869$) other new findings detected, two of which were dislocations and two tendon injuries.

Discussion

Overall, the diagnostic yield of radiographic imaging for assessing lacerations was relatively low, with only 10 % of patients having clinically relevant new findings detected on radiographs. This is in line with other report findings of low value imaging, with reported ranges of diagnostic yield from 0 to 27.8 %.[28] The findings indicates that most of the radiographs provided no new information or only confirmed findings already evident from clinical examinations, such as visible soft tissue lacerations and swelling. These findings emphasise the importance of critically evaluating the clinical value of imaging to avoid tests that may offer little patient benefit which aligns with the goals of the Choosing wisely campaign.[29]

The low yield may reflect, in part, limitations in pre-imaging clinical assessment or physical examinations. Our study observed that nearly half of the imaging requests lacked specific clinical questions, and more than a third of the cases provided insufficient

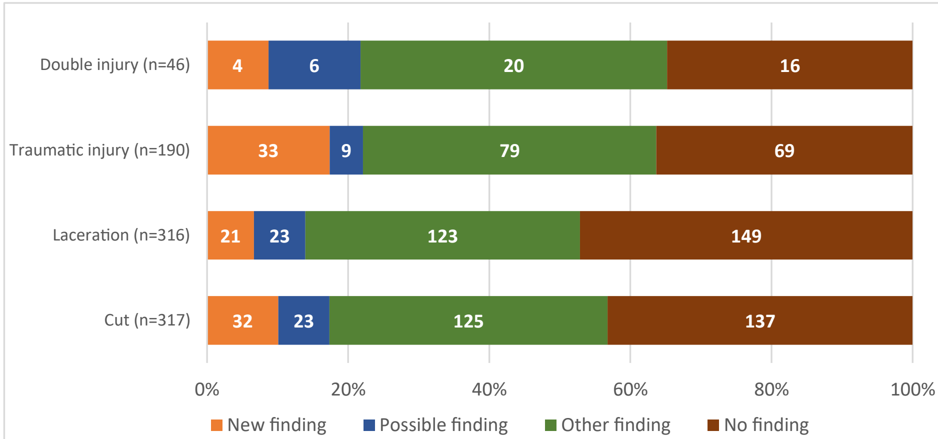

Figure 2. Distribution of radiological findings based on the mechanisms of injury.

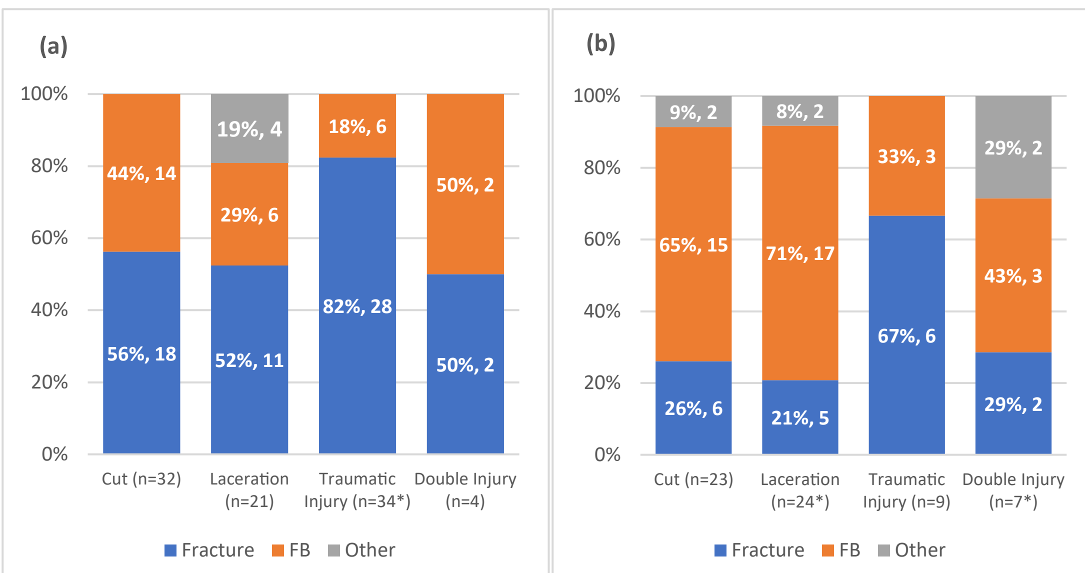

Figure 3. Distribution of new findings (a) and possible findings (b) based on mechanism of injury. *One case revealed both a fracture and a FB.

information about the mechanism of injury. This lack of clinical history is frequently observed in medical imaging studies.[30–32] While this may not mean a thorough examination was not undertaken, physical exams help clinicians to effectively narrow down the subset of patients who may genuinely benefit from radiographic imaging, thereby limiting unnecessary imaging for cases where it is unlikely to provide meaningful diagnostic insight.[26,27,33] This selective approach contributes to a more targeted use of radiographs by screening out cases that do not meet specific clinical criteria, ultimately minimising low-yield imaging. Additionally, ordering diagnostic tests are thought to improve patient satisfaction, however, discussions with patients on what imaging could or could not show improves patient-focused care and shared decision-making which influences patient satisfaction.[29,34]

The limited diagnostic yield of radiographs in laceration cases highlights a significant gap between clinical queries for suspected pathologies and actual confirmed findings, with a confirmation rate of 8 % for fractures and 5 % for FBs. This discrepancy likely reflects a mismatch between clinical judgment and the necessity of imaging, as well as limited understanding of the utility of radiographs in specific presentations, particularly lacerations, where diagnostic findings may be inherently limited.[16,19,21,23] While injury presentations may necessitate radiographic imaging due to the risk of fractures, when lacerations are the primary concern without clinical signs of underlying bone involvement, the utility of imaging may be limited. Additionally, this study's findings showed no significant association between mechanism of injury and radiological findings which further indicates that injury type alone does not reliably indicate the diagnostic value of radiographs. This challenges the assumption that certain mechanisms necessitate imaging as part of routine assessment[9,25,32] and suggests that clinical judgment regarding the necessity of imaging may sometimes overestimate the utility of radiographs in specific presentations. Bridging this gap may require clearer clinical guidelines and a stronger understanding among referrers of when radiographic imaging is most likely to provide diagnostically valuable information.[30,32] However, even with existing guidelines, clinical sites face challenges to change default practices among staff and require regular reminders of evidenced-based literature that supports change.[35]

A substantial proportion of lacerations in this study involved injuries to the hand and fingers, which aligns with common ED presentations.[2] The observed difference in injury mechanisms, with lacerations predominantly affecting the upper limb and trauma the lower limb, suggests a need for region-specific imaging protocols. Routinely using radiographs for all lacerations, especially in the upper limb, may contribute to overuse without significant diagnostic benefit, as radiographs are limited in soft tissue assessment. However, it is worth noting that patients with suspected fractures after trauma follow established guidelines, often mandate radiographs regardless of any laceration.[17,25,36] This difference in clinical presentation reinforces the importance of context-specific imaging protocols, as fracture suspicion alone may justify radiographic imaging irrespective of additional superficial injuries, like lacerations.

In this study, the proportion of possible findings was nearly equal to the proportion of new findings, indicating a balanced detection rate between suspected and positive findings. Notably, ambiguity around the presence of FBs contributed significantly to the category of possible findings. In fact, there were more suspected FBs than confirmed cases of FBs. This highlights the challenge of accurately identifying FBs on radiographs, especially when subtle indicators fall below the threshold for clear detection. The challenge of detecting FBs is further complicated by limited clinical history accompanying imaging requests. Often, the mechanism of injury and clinical questions are misaligned, making it difficult to focus on relevant findings. For instance, a patient might present after a fall or crush injury where a fracture is a reasonable clinical suspicion. However, referrers may also request radiographs to rule out FBs without providing context in the clinical history to justify this concern. When clinical notes lack any indication that a FB might be present, it becomes challenging to prioritise imaging criteria or focus on relevant findings, potentially leading to unnecessary imaging or misinterpretation.

The variability in radiographic sensitivity for detecting FBs aligns with previous research, which shows that factors such as the composition, size, and location of FBs heavily influence detection accuracy.[13,18,20] Consistent with these findings, the FBs identified in our study, comprising high-density materials like metal and rocks, demonstrated higher visibility on radiographs, reinforcing the notion that only certain FB types are reliably detectable. A notable finding was the distinctly higher proportion of fractures among new findings, contrasting with the greater proportion of FBs in the possible or inconclusive findings. This disparity suggests that fractures, with their distinctive radiographic appearance, are more readily identified as new findings, while FBs often remain ambiguous on initial radiographic interpretation. Together, these findings advocate for a judicious use of radiographs, recognising their strength in fracture detection while emphasising caution in relying solely on imaging for FB identification in cases lacking evident high-density markers. These findings highlight the need for a cautious approach in radiographic utilisation, acknowledging its effectiveness in detecting fractures while understanding its limitations with foreign body detection. Future research should validate these findings across larger populations and settings, explore alternative imaging modalities for cases with limited radiographic yield, and develop evidence-based protocols to guide clinical decision-making in laceration management.

This study has a few limitations that should be considered in the interpretation of the findings. Due to the retrospective design, further clarification was not possible, particularly when imaging request forms lacked consistent or complete clinical information. However, the limited clinical history reflects the challenges faced by radiographers and radiologists. Additionally, by using “lacerations” as a keyword filter may have excluded cases where lacerations were undocumented or other terms, such as ‘gash’ or ‘graze’ may have been used instead. Furthermore, cases involving trauma-induced lacerations were not excluded. These patients may undergo radiographs following trauma protocols rather than laceration criteria alone, which may have influenced the proportion of fracture-related findings. It is important to note that while most cases in this study did not detect any pathology, such results can still be clinically useful by helping to rule out foreign bodies or bony involvement.

Conclusion

Plain radiographs have low diagnostic yield in patients presenting to the Emergency Department with lacerations, suggesting that routine imaging may often be unnecessary, as physical examination typically provides sufficient information. The findings support a shift toward more selective imaging criteria based on specific clinical indicators or at the very least, re-evaluating routine imaging practices for lacerations, particularly in the absence of clinical signs indicating deeper injury. By quantifying the yield in this specific context and highlighting gaps between clinical suspicion and imaging utility, this study contributes new evidence to inform more targeted, evidence-based imaging decisions in emergency settings. Implementing guidelines that reserve radiographs for cases with clear diagnostic value could reduce unnecessary imaging, lower patient radiation exposure, and optimise healthcare resources.

Ethics approval and consent to participate

Ethical approval was granted by the Sydney Local Health District’s Human Research Ethics Committee (2022/ETH01291). A waiver of consent was granted.

Availability of data

Raw data is not available and aggregated data is available within the manuscript.

Author contributions

DA and EE were involved in the design of the study and ethics application. DA collected the data. All authors contributed towards data analysis, and KC wrote the manuscript. All authors read and approved the final manuscript.

Generative AI use

N/A – AI was not used.

Conflict of interest statement

None.

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QUESTIONNAIRE
A6(26) Part 1 of 2
Radiographic imaging use for lacerations: A necessity or over- imaging?

INSTRUCTIONS

- Read through the article and answer the multiple-choice questions provided below.
- All questions have only **ONE** correct answer

Question 1: What percentage of radiographs performed for lacerations showed a new abnormal finding?

A: 3%
B: 7%
C: 10%
D: 15%

Question 2: Which pathology was most commonly confirmed in radiographs for laceration cases?

A: Tendon injury
B: Fracture
C: Dislocation
D: Vascular injury

Question 3: What was the percentage of radiographs that showed suspicious or inconclusive findings?

A: 5%
B: 7%
C: 12%
D: 15%

Question 4: Which foreign body type was most frequently identified in confirmed cases?

A: Glass
B: Wood
C: Metal
D: Plastic

Question 5: What proportion of imaging requests lacked a specific clinical question?

A: 25%
B: 33%
C: 50%
D: 46%

Question 6: Which anatomical region had the highest number of laceration-related radiographs?

A: Lower limb
B: Axial body
C: Facial bones
D: Upper limb

Question 7: What was the most common mechanism of injury for lower limb lacerations?

A: Traumatic injury
B: Cut
C: Laceration
D: Double injury

Question 8: Which injury mechanism had the highest rate of confirmed fractures?

A: Cut
B: Laceration
C: Traumatic injury
D: Double injury

Question 9: What percentage of axial body cases showed a new finding?

A: 20%
B: 15%
C: 10%
D: 25%

Question 10: Which mechanism of injury had the lowest rate of “no finding” reports?

A: Laceration
B: Double injury
C: Cut
D: Traumatic injury

THE END

QUESTIONNAIRE
A6(26) Part 2 of 2
Radiographic imaging use for lacerations: A necessity or over- imaging?

INSTRUCTIONS

- Read through the article and answer the multiple-choice questions provided below.
- All questions have only **ONE** correct answer

Question 1: What percentage of cases queried both fracture and foreign body?

A: 5%
B: 8%
C: 11.9%
D: 15%

Question 2: Which category had the highest number of "possible findings"?

A: Double injury
B: Traumatic injury
C: Laceration
D: Cut

Question 3: What percentage of fracture queries resulted in confirmed fractures?

A: 5%
B: 8%
C: 10%
D: 12%

Question 4: What percentage of foreign body queries resulted in confirmed FBs?

A: 2%
B: 5%
C: 7%
D: 10%

Question 5: Which clinical concern had no confirmed cases in the study?

A: Tendon injury
B: Fracture
C: Foreign body
D: Dislocation

Question 6: What campaign does the article align with in promoting imaging appropriateness?

A: Imaging Wisely
B: Radiology First
C: Choosing Wisely
D: Scan Smart

Question 7: What is the reported sensitivity of radiographs for FB detection in gelatine phantom studies?

A: 42%
B: 50%
C: 70%
D: 62%

Question 8: Which foreign body (FB) type is least visible on radiographs?

A: Metal
B: Porcelain
C: Wood / glass
D: Rock

Question 9: What percentage of wounds were found to be clinically examinable without imaging?

A: 90%
B: 70%
C: 80%
D: 95%

Question 10: What is a key recommendation from the Royal Australian and New Zealand College of Radiologists regarding superficial wounds?

A: Always image
B: Avoid routine radiographs
C: Image only if FB suspected
D: Use ultrasound instead

THE END

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ANSWER SHEET

A6(26)

Radiographic imaging use for lacerations: A necessity or over- imaging?

***Time spent on activity** **hour** **min**

You can complete any one, or all the parts of this activity.

PART 1												PART 2											
	A	B	C	D	E		A	B	C	D	E		A	B	C	D	E		A	B	C	D	E
1						6						1						6					
2						7						2						7					
3						8						3						8					
4						9						4						9					
5						10						5						10					

How relevant was the content of this activity to your scope of practice?			
Not at all	Somewhat	Mostly	Extremely

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