

Radiological Findings of Incidental Retained Broken Needle Fragment in the IVDU Population and its Potential Clinical Implication

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INTRODUCTION

Retained broken needles (RBNs) in patients is a potentially underreported complication of intravenous drug use (IVDU) with marked clinical variability. Aside from the well-documented complications of IVDU, RBNs can increase the risk of injection site infection and needlestick injury. In some cases, RBNs are found incidentally in asymptomatic patients. Identification of RBNs poses a challenge for radiologists due to small size, superimposition, plane of section imaging considerations, and a lack of familiarity with RBNs appearance. This study aims to assess the radiological findings of RBNs in the IVDU population and their potential clinical management.

METHODS

This study included all patients with a history of IVDU who presented to the Temple University Hospital with RBNs in 2021. Presence of RBNs was confirmed via imaging. Data collected on the study population included RBN location and size, complications, blood culture results, and imaging modality. Cases of incidental findings were investigated and classified as the presence of a RBN without prior knowledge of a retained needle.

RESULTS

71 patients in the IVDU population with radiographically discovered RBNs were identified. RBNs were most observed in the foot (31.0%), forearm/elbow (19.7%), neck (16.9%), and upper arm (9.86%). Fifty-nine patients (83.1%) with RBNs were found to be incidental. Radiography located needle fragments (56.3%) slightly more often than CT (43.6%). Around half (50.7%) of all patients presented with positive blood cultures. Staphylococcus was most prevalent (66.7%) with MRSA representing 18.3% of all patients with positive cultures. Two patients demonstrated RBN emboli to the lung (2.82%).

CONCLUSION

This study suggests that patients with IVDU-RBNs are commonly found incidentally. These patients are likely at an increased risk for infectious complications when compared to published rates in the non-RBN IVDU population, particularly MRSA. As such, prompt radiologic identification of RBNs may be imperative as IVDU-RBN patients may require a different antibiotic course. Greater awareness of RBNs and the ability to employ post-processing imaging techniques may prove advantageous in identifying occult RBNs.

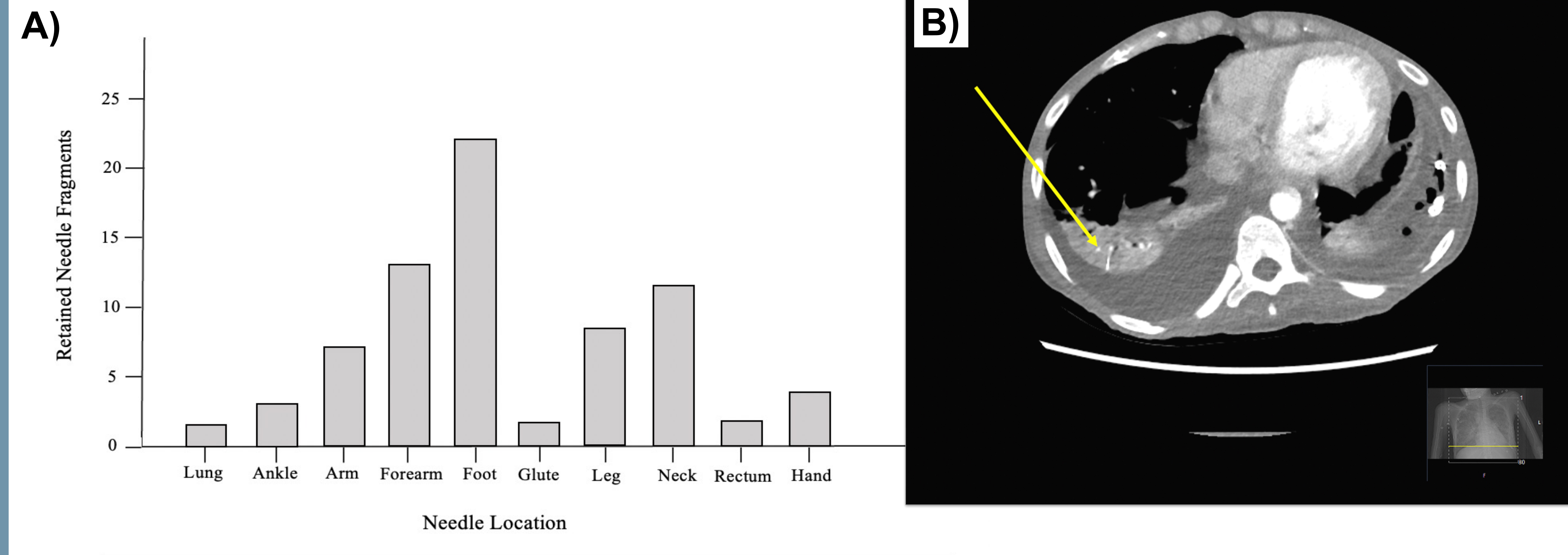


Figure A. Anatomic location of RBN's discovered in 71 IVDU patients presenting to the ED in the year 2021.

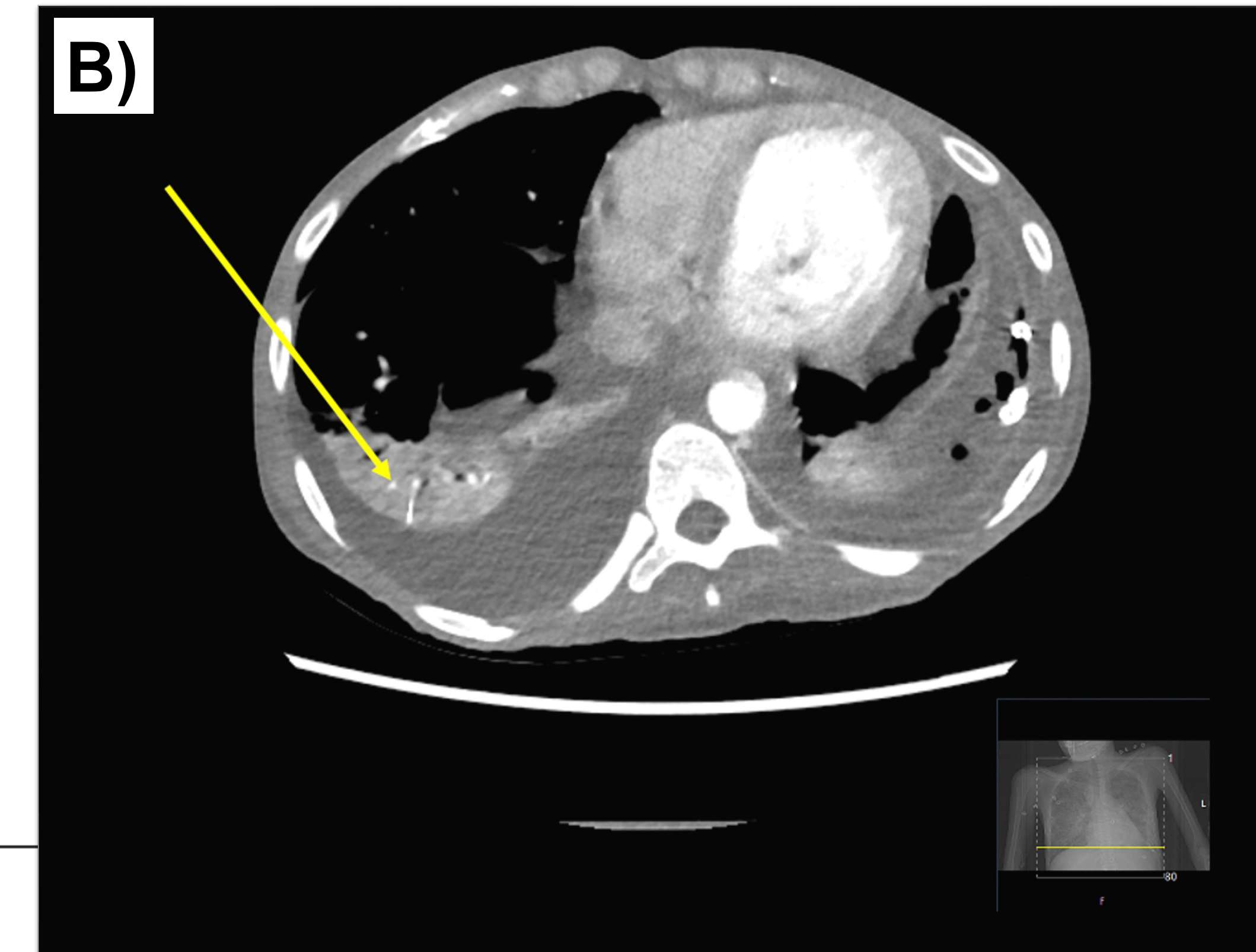


Figure B. 20-year-old female with embolized needle fragment. Coronal CT with RBN embedded in right groin soft tissues.



Figure C. 3D volume rendering of CT thorax with same broken needle fragment within the right lower lobe posterior segmental pulmonary artery.

Retained broken needles are commonly found incidentally.

Patients with RBN's are likely at increased risk for infectious complications.

REFERENCES

1. Opioid data analysis and resources. (2022, June 1). Cdc.gov. <https://www.cdc.gov/opioids/data/analysis-resources.html>
2. Temple honored by America's essential hospitals for innovative hub-and-spoke model for patients with opioid use disorder. (n.d.). Temple Health. Retrieved July 18, 2022, from <https://www.templehealth.org/about/news/temple-honored-by-americas-essential-hospitals-innovative-hub-and-spoke-model-patients-with-opioid-use-disorder>
3. Fu, X., Chen, K., Liao, X., & Shen, K. (2017). Case report: surgical removal of a migrated needle in right ventricle of an intravenous drug user. *Substance Abuse Treatment, Prevention, and Policy*, 12(1). <https://doi.org/10.1186/s13011-017-0134-1>
4. Delaney, F. T., Stanley, E., & Bolster, F. (2020). The needle and the damage done: musculoskeletal and vascular complications associated with injected drug use. *Insights into Imaging*, 11(1), 98. <https://doi.org/10.1186/s13244-020-00903-5>
5. Norfolk, G. A., & Gray, S. F. (2003). Intravenous drug users and broken needles—a hidden risk?: IDUs and broken needles. *Addiction (Abingdon, England)*, 98(8), 1163–1166. <https://doi.org/10.1046/j.1360-0443.2003.00462.x>
6. Gladman, J. (2019). Pins and needles in the groin: an incidental finding of retained needle fragments in an intravenous drug user. *BMJ Case Reports*, 12(2), bcr-2018-226220. <https://doi.org/10.1136/bcr-2018-226220>
7. Contegiacomo, A., Conti, M., Trombatore, P., Dezio, M., Muciaccia, M., Lozupone, E., Natale, L., & Manfredi, R. (2020). Radiological features and management of retained needles. *The British Journal of Radiology*, 93(1114), 20200316. <https://doi.org/10.1259/bjr.20200316>
8. Macilquham, M. D., Riley, R. G., & Grossberg, P. (2003). Identifying lost surgical needles using radiographic techniques. *AORN Journal*, 78(1), 73–78. [https://doi.org/10.1016/s0001-2092\(06\)61347-1](https://doi.org/10.1016/s0001-2092(06)61347-1)
9. Galbraith, P. (2007). Permanently retained acupuncture needles: Radiographic findings and case report. *Radiology Case Reports*. <https://doi.org/10.2484/rcr.2006.1.120>
10. Laukkala, H., Arponen, O., Murto, M. O., & Nevalainen, O. P. (2022). Chronic unilateral groin pain in a young patient who injects drugs—a case report of needle fragment retentions. *Addiction Science & Clinical Practice*, 17(1), 27. <https://doi.org/10.1186/s13722-022-00309-2>

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