

Transmission of New Delhi Metallo- β -lactamase Producing *Escherichia coli* through a Gastroscope from an Esophagogastroduodenoscopy Procedure

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BACKGROUND

Transmission of multi-drug resistant bacteria, such as carbapenem-resistant Enterobacteriaceae (CRE) has been associated with duodenoscopes containing elevator channels. Published data on outbreaks associated with gastroscopes is rare.¹

OBJECTIVE

To investigate the transmission of New Delhi Metallo- β -lactamase producing *Escherichia coli* (NDM-E.coli) between two hospitalized patients to determine relatedness and potential sources of transmission including a common gastroscope.

METHODS

Case study methodology was used and involved collecting the following datasets:

- Chart reviews to determine possible links between two cases occurring July 2023 – September 2023
- Whole genome sequencing (WGS)
- Unit-wide point prevalence screening
- Patient notifications of potential exposure and screening
- Infection Prevention audits on endoscope cleaning
- Scope culturing
- Scope inspection by a third party

FIGURES

Figure 1. Timeline of hospital encounters for CRE-NDM cases occurring from July 2023 through September 2023.

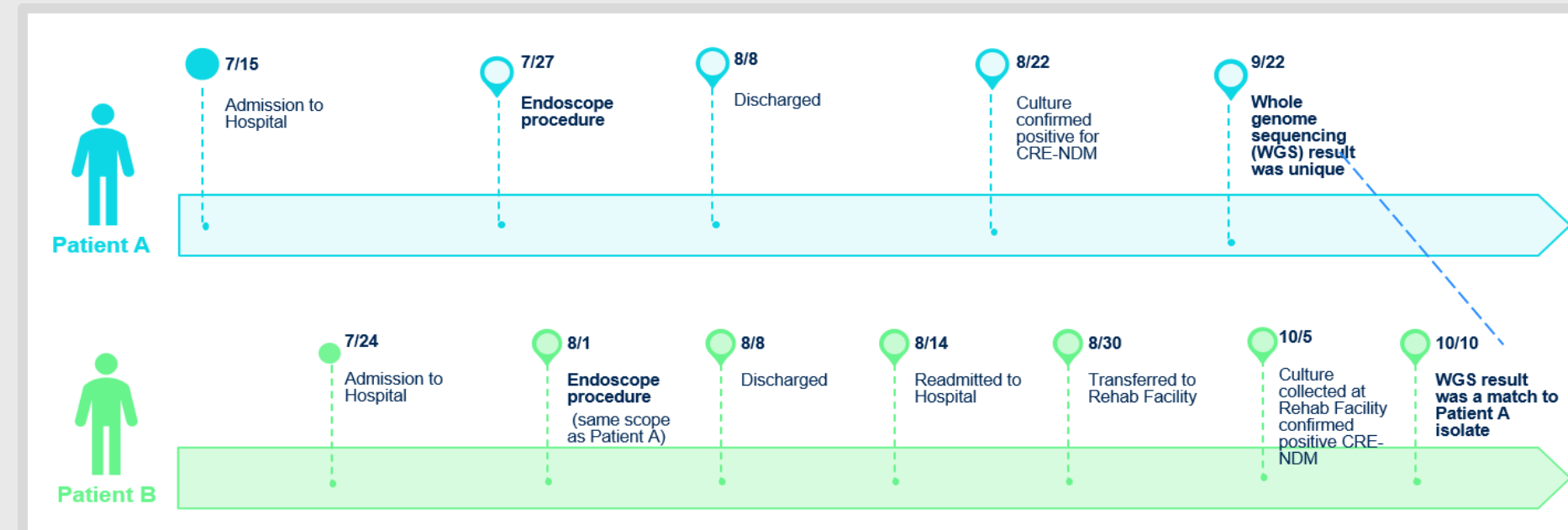
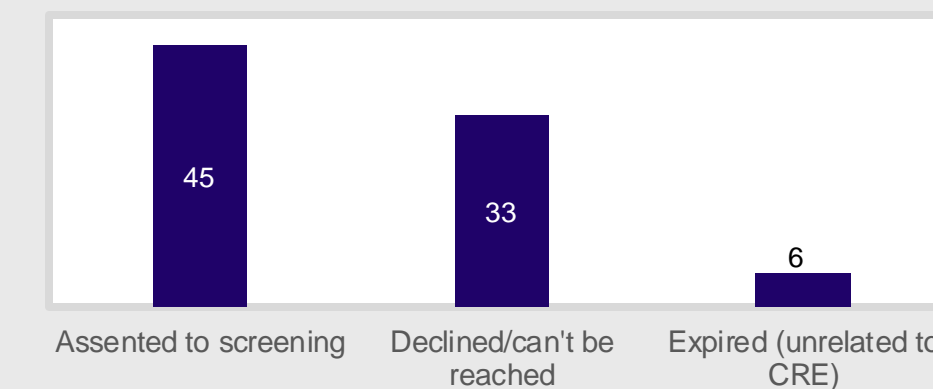


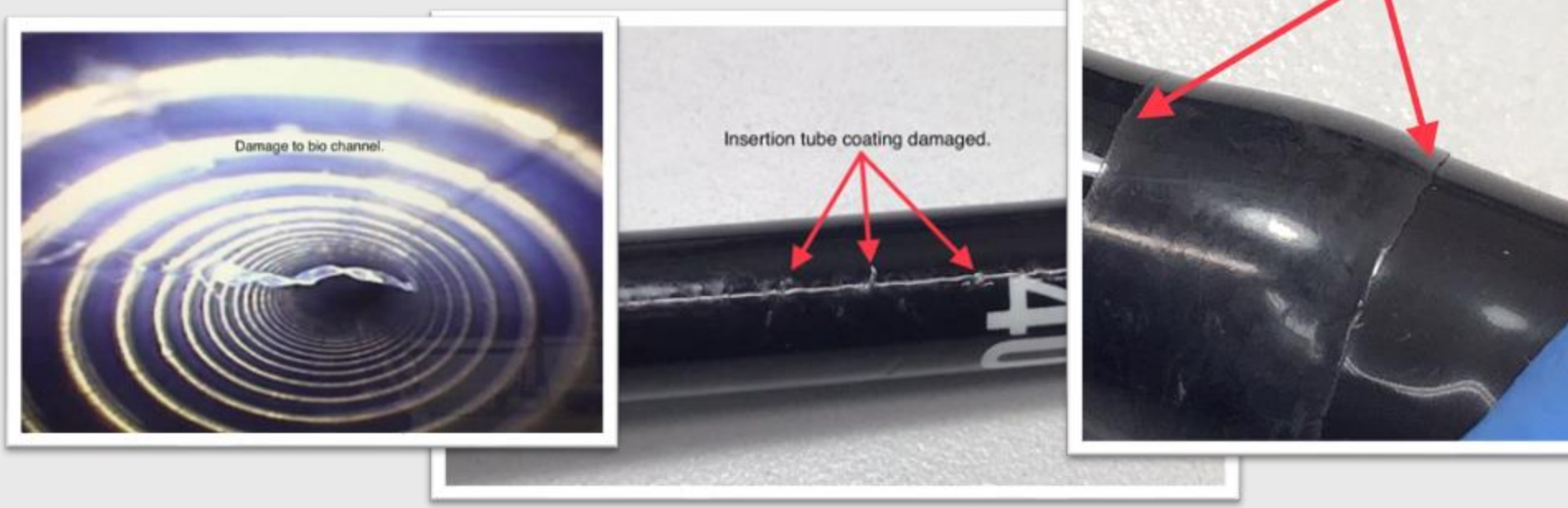
Figure 2. Timeline of patient exposures to the same endoscope and follow-up inspection and culturing of scope.



Figure 3. Exposed patient notification and screening. All screened patients (N = 45) were negative.



Figures 4 - 6. Scope inspection findings (Inspection photos provided by Endoscopy Repair Specialist Inc (ERS)).



RESULTS

- Both patients had a common gastroscope used, five days apart.
- The same gastroscope was used on 83 patients prior to sequestering, 44 of whom assented to a screening test and were all negative.
- 35 patients, admitted to inpatient units common to where the case had been previously hospitalized, were screened negative.
- Validation of cleaning and disinfection processes identified no breaches in practice.
- Scope culturing was negative.
- Third-party inspection found damage to the internal bio channel and insertion tube, suggesting potential causes of contamination.

CONCLUSION

WGS results with genomic linkage and the presence of a similar antimicrobial resistance gene points to a plausible epidemiological linkage to the shared endoscope.

Per the Food and Drug Administration (FDA), a sampling and culturing study conducted on newer models of duodenoscopes found a 1.1% reprocessing failure rate with high concern organisms, indicating there will be an inherent risk of infection in procedures utilizing scopes.²

Health systems must consider gastroscopes as a source of contamination and validate existing practices. Additional studies need to be performed to assess and decrease this risk.

REFERENCES

1. Yang AF, Sherman A, Nazarian E. et al. 2023. Endoscopic Transmission of NDM producing Klebsiella pneumonia through a gastroscope without an elevator channel. Poster presented at 2023 ID week; Boston, Massachusetts.
2. U.S. Food & Drug Administration: Medical Devices: Medical Device Safety: Safety Communication: Use Duodenoscopes with Innovative Designs to Enhance Safety FDA Communication. 2020 June 30. [accessed 2024 March 20]. <https://www.fda.gov/medical-devices/safety-communications/use-duodenoscopes-innovative-designs-enhance-safety-fda-safety-communication>.

DISCLOSURES

Nothing to disclose.