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RESEARCH ARTICLE

EUS-Guided Detection of Multidrug-Resistant Shigella dysenteriae from Retroperitoneal Cyst Fluid: A Rare Gastroinfectious Entity

Sanjib Kumar Kar[1],Monalisa Panigrahi[2], Rakesh Kumar Barik[3], Biswojit Behera[1], Abhisek Kumar[1], Ananya Das[4], Santosh Kumar Mohanty[5],

ABSTRACT

Background: Shigella dysenteriae is an invasive enteric pathogen classically associated with bacillary dysentery. Extraintestinal isolation is rare and typically occurs in immunocompromised hosts. Retroperitoneal cyst infections due to Shigella have scarcely been reported. Emerging antimicrobial resistance among Shigella species further complicates management.

Case Presentation: A 47-year-old immunocompetent male presented with abdominal pain and was found to have a retroperitoneal aortocaval multiseptated cyst on imaging. Endoscopic ultrasound (EUS)-guided fine needle aspiration yielded hemorrhagic cyst fluid. Microbiological culture grew multidrug-resistant Shigella dysenteriae. Antimicrobial susceptibility testing, interpreted according to CLSI guidelines, revealed resistance to third-generation cephalosporins and carbapenems. The patient was treated with culture-directed therapy and improved clinically.

Conclusion: This case highlights a rare extraintestinal presentation of multidrug-resistant Shigella dysenteriae and underscores the importance of microbiological evaluation of cystic lesions and adherence to standardized susceptibility testing guidelines.

Keywords: Shigella dysenteriae; multidrug resistance; CLSI; retroperitoneal cyst; EUS-FNAC; extraintestinal infection.
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INTRODUCTION

Shigella species are gram-negative, non-motile bacilli belonging to the family Enterobacteriaceae and are a major cause of inflammatory diarrhea worldwide.[1] Among the four species, *Shigella dysenteriae* is particularly associated with severe disease due to Shiga toxin production.

Extraintestinal manifestations of shigellosis are uncommon and include bacteremia, osteomyelitis, meningitis, and localized abscess formation[2] These events are typically reported in malnourished children or immunocompromised individuals.

Retroperitoneal cystic lesions are rare and are commonly lymphatic, mesenteric, or developmental in origin.[3] Secondary infection may occur, but isolation of *Shigella dysenteriae* from such lesions is exceedingly unusual. Furthermore, the global emergence of multidrug-resistant (MDR) *Shigella* strains poses a growing therapeutic challenge.[4-5]

We report a rare case of MDR *Shigella dysenteriae* isolated from a retroperitoneal aortocaval cyst diagnosed via EUS-guided FNAC.

[1]Department of Gastroenterology, Indian Institute of Gastroenterology and Hepatology, Cuttack, Odisha, India

[2]Department of Microbiology, Hi-Tech Medical College and Hospital, Bhubaneswar, Odisha, India

[3]Department of Hepatology, SCB Medical College and Hospital, Cuttack, Odisha, India

[4]Department of Radiology, Indian Institute of Gastroenterology and Hepatology, Cuttack, Odisha, India

[5]Department of General Surgery, Indian Institute Of Gastroenterology and Hepatology, Cuttack, Odisha ,India

Corresponding author: Monalisa Panigrahi, Assistant Professor, Department of Microbiology, Hi-Tech Medical College and Hospital, Bhubaneswar, Odisha, India. Email: monapani82@yahoo.com

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Case Presentation

A 47-year-old male presented with intermittent dull abdominal pain of several weeks' duration. There was no history of diarrhea, fever, gastrointestinal bleeding, prior abdominal surgery, tuberculosis, or immunosuppression.

On examination, he was afebrile and hemodynamically stable. Abdominal examination was unremarkable.

Laboratory Investigations

- Hemoglobin: 12.5 g/dL
- Total leukocyte count: 4.97 $\times 10^3/\mu L$
- Platelet count: 203 $\times 10^3/\mu L$
- Renal function: Within normal limits
- Coagulation profile: Normal
- No evidence of systemic inflammatory response was noted.

Radiological Findings

Contrast-enhanced CT of the abdomen demonstrated a well-defined, non-enhancing fluid attenuation lesion measuring 38 × 22 mm in the aortocaval region, abutting the third part of the duodenum. There was no solid component or lymphadenopathy. Findings were suggestive of a retroperitoneal cyst, possibly lymphatic.

Endoscopic Ultrasound Findings

EUS revealed an anechoic multiseptated lesion measuring 39 × 33 mm in the aortocaval window. Adjacent pancreas and biliary tree were normal.

EUS-guided FNAC was performed using a sterile 22-gauge needle. Approximately 2 mL of hemorrhagic cyst fluid was aspirated and sent for cytological, biochemical, and microbiological analysis.

Microbiological Findings

Specimen Processing

The aspirated cyst fluid was transported promptly under sterile conditions to the microbiology laboratory.

- Direct Gram staining was performed.
- Aerobic culture was inoculated onto Blood agar,MacConkey agar and automated culture bottles
- Plates were incubated at 35–37°C for 18–24 hours.

Culture Characteristics

After incubation, non-lactose fermenting colonies were observed on MacConkey agar. The organism was:

- Gram-negative bacilli on microscopy
- Oxidase negative
- Catalase positive
- Non-motile
- Biochemical identification revealed:
- Indole negative
- Urease negative
- Citrate negative
- TSI: K/A without gas or H_2S

These findings were consistent with *Shigella* species. Final identification as *Shigella dysenteriae* was confirmed using standard biochemical profiling and automated identification systems.

Antimicrobial Susceptibility Testing

Antimicrobial susceptibility testing (AST) was performed using the automated broth microdilution method. Interpretation of minimum inhibitory concentrations (MICs) was done according to the Clinical and Laboratory Standards Institute (CLSI) M100 Performance Standards for Antimicrobial Susceptibility Testing, 2024 edition[6].

The isolate demonstrated

- *Susceptible*
- Amikacin
- Gentamicin
- Ampicillin-sulbactam
- Ciprofloxacin
- Norfloxacin
- Minocycline
- Resistant:
- Ceftriaxone
- Ceftazidime
- Cefepime
- Aztreonam
- Imipenem
- Meropenem
- Ertapenem
- Colistin
- Trimethoprim-sulfamethoxazole

Based on resistance to ≥3 antimicrobial classes, the isolate fulfilled criteria for multidrug-resistant (MDR) *Shigella***.**

Significance of Resistance Pattern

Resistance to third-generation cephalosporins suggests possible extended-spectrum β-lactamase (ESBL) production. Carbapenem resistance in *Shigella* remains rare but has been increasingly reported due to acquisition of plasmid-mediated carbapenemase genes such as NDM and OXA-type enzymes.[5-7]

The emergence of carbapenem-resistant *Shigella* strains represents a significant public health concern, particularly in regions with high antimicrobial pressure.[4]

Management and Outcome

The patient was treated with culture-directed intravenous antibiotics based on susceptibility results. He showed symptomatic improvement and remained clinically stable. No recurrence was noted during short-term follow-up.

DISCUSSION

Extraintestinal shigellosis is uncommon and usually associated with bacteremia in high-risk populations.[2] The mechanism in this case may involve transient bacteremia with hematogenous seeding of a pre-existing retroperitoneal lymphatic cyst.

The increasing prevalence of multidrug-resistant *Shigella* species is well documented. Resistance to ampicillin and trimethoprim-sulfamethoxazole has become widespread. More concerning is the rising resistance to fluoroquinolones and third-generation cephalosporins.[4]

Carbapenem resistance in *Shigella* remains rare but has been reported in association with transferable resistance genes.[7] The detection of carbapenem-resistant *Shigella dysenteriae* in this case underscores the evolving antimicrobial resistance landscape.

Adherence to CLSI guidelines ensures standardized interpretation of susceptibility results and supports appropriate therapeutic decisions.[6]

This case emphasizes

- The importance of sending cyst fluid for culture
- The diagnostic value of EUS-guided FNAC
- The growing threat of MDR *Shigella*
- The need for antimicrobial stewardship

CONCLUSION

We report a rare extraintestinal presentation of multidrug-resistant *Shigella dysenteriae* isolated from a retroperitoneal aortocaval cyst diagnosed via EUS-guided FNAC. This case underscores the importance of microbiological evaluation of atypical cystic lesions and highlights the emerging challenge of drug-resistant *Shigella* infections.

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