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CASE REPORT

Comparison of [^{99m}Tc]Tc-phytate and [^{99m}Tc]Tc-antimony sulfide colloid in a patient with non-parasitic chyluria

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ABSTRACT

Chyluria, the passage of chyle into urine due to lymphatic–urinary fistulas, may arise from parasitic or non-parasitic causes. In non-endemic regions, trauma, surgery, infection, or malignancy are more common etiologies. Lymphoscintigraphy is a valuable noninvasive tool for detecting lymphatic leaks; however, the choice of radiotracer significantly affects diagnostic accuracy. We report the case of a 39-year-old man with milky urine following pelvic trauma. Initial lymphoscintigraphy using [^{99m}Tc]Tc-phytate showed bladder activity, but physiological tracer excretion could not be excluded. Repeat imaging with [^{99m}Tc]Tc-antimony sulfide colloid demonstrated no early urinary activity; however, after fatty meal provocation and delayed scanning, clear tracer accumulation in the bladder was visualized and confirmed by SPECT/CT, establishing the diagnosis of chyluria. Further evaluation revealed intestinal lymphangiectasia, suggesting an underlying lymphatic abnormality potentially exacerbated by trauma. This case emphasizes the importance of selecting specific radiotracers and incorporating provocation with delayed imaging to improve the sensitivity and specificity of chyluria assessment.

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INTRODUCTION

Chyluria is a condition characterized by the presence of chyle in the urine, resulting from the formation of lymphatic-urinary fistulas. In endemic regions, filariasis is the predominant cause, whereas in non-endemic areas, chyluria more commonly arises from trauma, surgery, infection, or malignancy [1, 2]. Lymphoscintigraphy has emerged as a reliable and noninvasive method for detecting and localizing lymphatic leaks, thereby aiding in diagnosis and management [3-5].

CASE PRESENTATION

A 39-year-old male presented with milky urine (Figure 1), most prominent in the morning, after meals, and following prolonged recumbency. He also reported tingling and pain in both groin regions with mild diarrhea. Urinalysis showed proteinuria and sterile pyuria. Two months before symptom onset, the patient had experienced pelvic trauma in a truck accident; he had no previous history of surgery. Lymphoscintigraphy was performed after intradermal injection of 37 MBq of [^{99m}Tc]Tc-phytate into the bilateral dorsal feet, followed by dynamic and whole-body imaging. (Figure 1). Normal tracer uptake in lymphatic channels and lymph nodes was noted. Tracer activity appeared in the bladder from frame 20 onward and was also seen in the kidneys on whole-body images, suggestive of chyluria. However, as [^{99m}Tc]Tc-phytate is known to exhibit urinary excretion, a physiological cause could not be ruled out [6]. To clarify the findings, the scan was repeated using [^{99m}Tc]Tc-antimony sulfide colloid, a radiotracer with negligible urinary visualization. Both dynamic imaging and whole-body imaging (Figure2) were performed. This time, no tracer activity was observed in the bladder or kidneys during the 60-minute dynamic phase or on whole-body images, suggesting that the initial bladder findings were likely physiological rather than pathological. To provoke chyle leakage, the patient consumed a fatty meal and remained in a supine position for two hours. A delayed whole-body scan was then performed, which revealed tracer activity in the bladder. Additionally, SPECT/CT imaging confirmed tracer accumulation within the bladder, thereby establishing the diagnosis of chyluria (Figure 3).

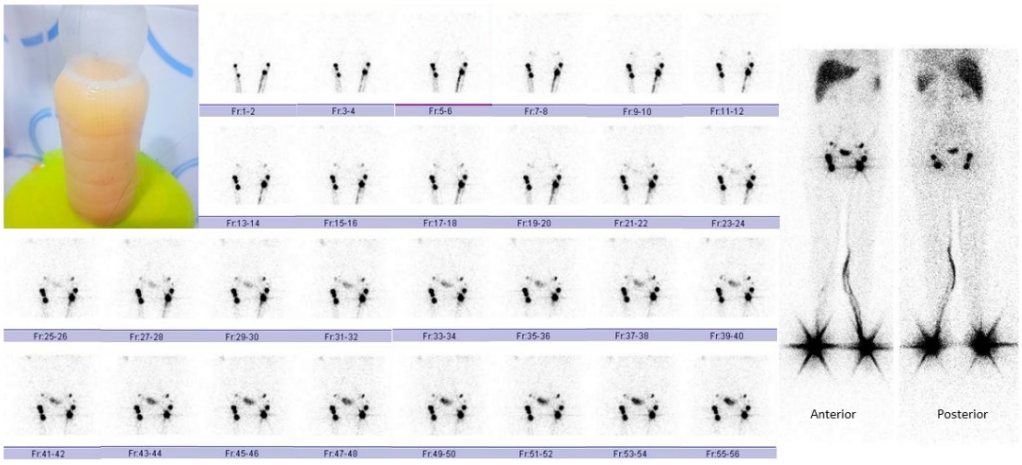

Figure 1. Initial lymphoscintigraphy with [^{99m}Tc[Tc-phytate shows normal lymphatic uptake and nodal visualization. Tracer activity in the bladder may represent physiological urinary excretion or chyluria

DISCUSSION

As the patient residential area was not endemic for filariasis, a non-parasitic etiology was considered more likely. The patient underwent comprehensive evaluation for possible causes, including tuberculosis, HIV, systemic lupus erythematosus, malignancy (via urine cytology), celiac disease, and parasitic infections. All tests were negative. Imaging—pelvic MRI, cystoscopy, and CT—were also unremarkable. Due to persistent diarrhea, colonoscopy was performed and revealed intestinal lymphangiectasia. Although pelvic trauma was present, intestinal lymphangiectasia suggests a pre-existing or diffuse lymphatic abnormality, possibly unmasked or worsened by the trauma [7-9]. The patient was managed conservatively with a low-fat diet enriched with medium-chain triglycerides (MCTs), which led to partial symptomatic improvement. While [^{99m}Tc]Tc-phytate may cause

false positives due to urinary visualization, [^{99m}Tc]Tc-antimony sulfide colloid offers greater specificity [10, 11]. For lymphatic abnormalities in the urinary system, [^{99m}Tc]Tc-phaytate should not be used. Our experience underscores that fatty meal provocation and delayed imaging enhance sensitivity in inconclusive cases.

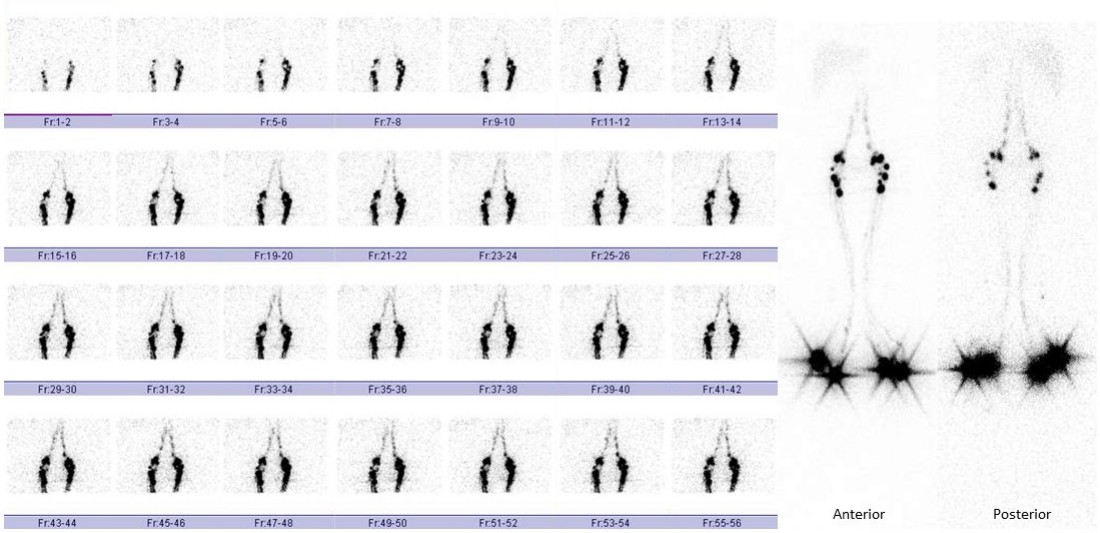

Figure 2. Repeat lymphoscintigraphy with [^{99m}Tc[Tc-antimony sulfide colloid shows normal lymphatic uptake without tracer activity in the bladder or kidneys during dynamic or whole-body imaging, suggesting that the initial bladder findings were more likely physiological than due to chyluria

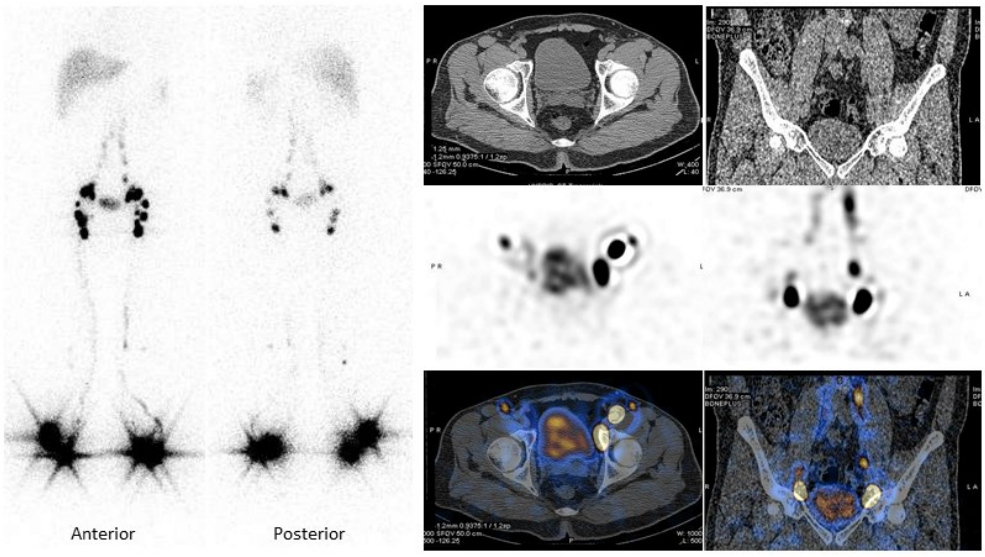

Figure 3. Fat-provoked delayed lymphoscintigraphy and SPECT/CT demonstrate tracer activity within the bladder following a fatty meal, confirming chyluria

CONCLUSION

This case highlights the importance of selecting appropriate radiotracers and imaging protocols in diagnosing chyluria. [^{99m}Tc]Tc-antimony sulfide colloid offers greater specificity than [^{99m}Tc]Tc-phytate, and fatty meal provocation with delayed imaging improves diagnostic accuracy.

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