

Delayed severe anaphylactoid reaction following retrograde pyelogram: A case report

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Abstract

Retrograde pyelography is used to evaluate upper collecting system in patients with hematuria who have contrast allergy. Reported here is a patient who developed severe, late-onset anaphylactoid reaction after retrograde pyelography. Premedication is commonly used to reduce risk of allergic reaction but has limited evidence to support its efficacy. Caution should be used when evaluating microhematuria with retrograde pyelography in patients with prior anaphylactoid reaction to intravenous contrast.

Keywords

Contrast allergy, retrograde pyelogram, anaphylactoid reaction, iodinated contrast

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Introduction

The American Urological Association recommends retrograde pyelogram as an option in the work-up of asymptomatic hematuria in patients with contrast allergy (expert opinion). Iodinated contrast media have been reported to be absorbed from the pyelocaliceal system and urinary bladder in animal studies and children during retrograde pyelogram and cystourethrography.^{1–3} There are only a few reports of anaphylactoid reaction during non-intravenous administration of iodinated contrast during urologic procedures (Table 1). We present a case of late-onset severe anaphylactoid reaction following retrograde pyelogram.

Case presentation

A 76-year-old morbidly obese man with a history of allergic reaction to intravenous contrast was referred to urology for hematuria. Computed tomography (CT) scan of abdomen/pelvis without contrast was obtained as well as flexible cystoscopy for work-up. He was found to have a 5 mm papillary lesion on the lateral bladder wall. Subsequently, in the operating room, he underwent cystoscopy, retrograde pyelogram, transurethral resection of bladder tumor (TURBT), and intravesical instillation of mitomycin C. The patient received dexamethasone 10 mg and diphenhydramine 50 mg intravenously prior to procedure, and retrograde pyelogram was

performed with slow administration of contrast without evidence of pyelovenous backflow. The upper tracts and bladder were drained of contrast under fluoroscopic guidance prior to TURBT. Patient was discharged in stable condition several hours in the post-anesthesia care unit. He returned to the hospital via emergency department 4 h after discharge with tongue swelling, facial and neck edema, and difficulty breathing. Patient did not receive any other medication except for pain pills in the interim. The patient was diagnosed with late anaphylactoid reaction to iodinated contrast which was used only intraluminally in the lower and upper collecting tracts during retrograde pyelography.

He was intubated and admitted to the intensive care unit (ICU) for monitoring. His lab works, blood pressure, and body temperature stayed within the normal range and he did not exhibit anasarca, urticaria/hives, or pruritus. The patient's

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Table 1. Previous studies reporting adverse reactions to non-intravenous administration of iodinated contrast media.

Series	Study	Reaction	Treatment
Johanning ⁴	Retrograde pyelogram (RPG)	Severe shortness of breath and wheezing	IV: diphenhydramine rectal: aminophylline
	RPG	Dyspnea, wheezing, and hypotension ventricular tachycardia	IV: diphenhydramine, hydrocortisone, and epinephrine
Schmidlapp ⁵	RPG	Dyspnea and bronchospasm	IV: diphenhydramine and hydrocortisone
	RPG	Respiratory arrest and cardiac arrest	Unavailable
McAlister et al. ⁶	Cystogram	Urticaria	Antihistamines
Weese et al. ⁷	VUCG	Urticaria	None
	VUDS	Hypotension, tachycardia, and syncope	Trendelenburg position
Armstrong et al. ⁸	RPG	Urticaria, dyspnea, wheezing, and reintubation	IV: diphenhydramine, epinephrine and methylprednisolone Inh: racemic epinephrine and albuterol MDI

VUCG: voiding cystourethrogram; VUDS: videourodynamics; IV: intravenous; MDI: metered-dose inhaler.

O₂ saturation level stayed above 93% and did not require pressors. He was extubated on hospitalization day 2 and discharged in stable condition. Upon 2 weeks post-operative follow-up, there were no further sequelae of anaphylactoid reaction after the reported episode.

Discussion

Retrograde pyelogram is usually considered safe in patients with history of allergic reaction of radiocontrast medium with estimated anaphylactoid reaction around 0.26% or lower.^{4,7,8} The majority of reactions of radiocontrast media are not immunoglobulin E (IGE) mediated and therefore are called anaphylactoid.⁹ These reactions can be classified based on their timing, severity, pathogenesis, and so on with late reactions described as the ones occurring between 1 and 24 h following administration.⁹

The American College of Radiology (ACR) guidelines classify contrast reactions based on degree of severity.¹⁰ Severe reactions are life-threatening and include facial edema and laryngeal edema with stridor or hypoxia. Armstrong et al.⁸ described a case of immediate anaphylactoid reaction requiring reintubation after retrograde pyelogram despite steroid premedication and concluded that steroid premedication may not prevent this type of reaction. A recent review of inpatient data for 76,164 patients who underwent non-intravenous urinary tract imaging reported a rate of diagnosis of shock, anaphylaxis, angioedema, or other contrast-induced complications to be 0.48% or about 1 in 200.¹¹ These data included both those with and without prior diagnosis of allergy to iodinated contrast, and the presence of allergy did not affect the rate of adverse events.

Our case presentation supports the evidence that premedication with steroids and antihistamines may not prevent anaphylactoid reaction during retrograde pyelogram, although it

might have delayed the occurrence of the reaction. We suspect that urothelial disruption during TURBT may have contributed to systemic absorption of contrast media.

Our experience suggests that urologists should be cautious when administering contrast media via non-intravenous routes for evaluation of urothelial tract in patients with history of contrast allergy. The timing and severity of the allergic reaction may vary and premedication may not prevent the reaction. Use of low-pressure injection technique to prevent pyelovenous backflow or contrast extravasation is advisable. In addition, if urothelial integrity is suspected, alternative methods of urothelial tract evaluation must be considered.

Conclusion

We presented a case of late anaphylactoid reaction to radiocontrast media after non-intravenous use in the urinary collecting system. Such reactions can be severe and may not be prevented by steroid and/or antihistamine premedication. Reactions with non-intravenous use are considered extremely rare, and compromised urothelium may be a risk factor. Use of luminal contrast in a urologic setting should be performed with caution in patients with known radiocontrast allergy. Patients should be observed closely in the post-operative setting for signs or symptoms of anaphylactoid reaction.

Declaration of conflicting interests

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Ethical approval

Our institution does not require ethical approval for reporting individual cases or case series.

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Informed consent

Verbal informed consent was obtained from the patient(s) for their anonymized information to be published in this article. The verbal consent was witnessed via conference call with administrative office on duty and documented in the electronic medical record. The patient resides a long distance from the treating facility and with limited mobility.

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