



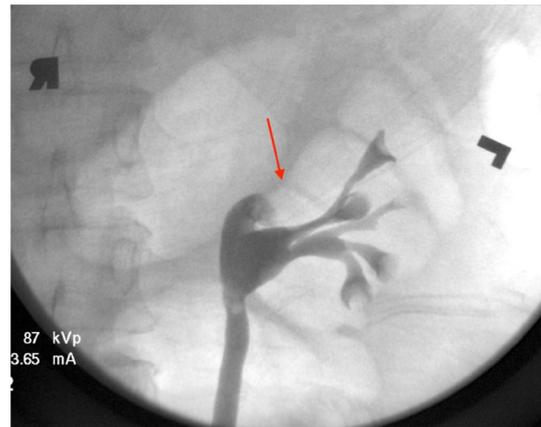
## The “phantom” calyx

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A “phantom” calyx refers to the imaging finding of lack of contrast opacification of a calyx or portion of the collecting system, where one should be, within an otherwise well-opacified pelvicalyceal system [1]. This appearance most often reflects a process that has infiltrated or obliterated the collecting system element [1]. The appearance was initially described on excretory urography (EXU) [1], but it may also be appreciated on retrograde pyelography (Fig. 1), and CT and MR urography (Fig. 2). The phantom calyx may be caused by tumor (especially urothelial carcinoma of the renal pelvis), infection (especially renal tuberculosis), edema from acute pyelonephritis, stricture related to renal calculus disease or trauma, renal ischemia, renal contusion, a congenital anomaly of the collecting system, or technical under filling during a procedure[1–3].

Once identified, a phantom calyx should be carefully correlated with the patient’s history, clinical data, and other imaging findings. Retrograde pyelography is the single-most reliable way to visualize a calyx that fails to opacify on EXU or CT or MR urography. Additionally, it may provide detailed anatomical information and allow for sampling of the urothelial process [1]. Be careful! A phantom lurking about may portend a sinister condition (Fig. 3).



**Fig. 1** An image from a left retrograde pyelogram showing no opacification of the upper pole calyx, a “phantom calyx” (red arrow), caused by an urothelial neoplasm



**Fig. 2** Coronal reformatted image from the excretory phase of a CT urogram in another patient showing the absence of filling of the upper pole calyx (red arrow) from an infiltrating urothelial neoplasm

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**Fig. 3** Another sinister “phantom”, in this case portrayed by Lon Chaney in the 1925 horror movie, *The Phantom of the Opera* (<https://pixabay.com/en/lon-chaney-vintage-movie-film-396748/>) accessed January 9, 2019 (Public domain)

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### Compliance with ethical standards

**Conflict of interest** The authors declare that they have no conflict of interest.

**Research involving human and animal rights** This article does not contain any studies with human participants or animals performed by any of the authors.

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