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CYSTOSCOPIC FINDINGS: A VIDEO TUTORIAL

Sara M. Lenherr, MD¹, Erin C. Crosby, MD², and Anne P. Cameron, MD¹

¹University of Michigan, Department of Urology, Ann Arbor, MI

²University of Michigan, Department of Obstetrics and Gynecology, Ann Arbor, MI

Abstract

Aim—Cystoscopy is frequently performed by gynecologists to ensure ureteral patency and no bladder injury when performing concomitant gynecologic procedures. Generally there are no additional findings on cystoscopy, however, when abnormalities arise, they might require either observation or intervention. Our aim was to create a visual library of benign, malignant and foreign-body pathologies incidentally encountered on cystoscopy.

Method—Cystoscopic findings were videotaped at the time of routine surgical care. Per Institutional Review Board approval, individual consent was waived as the videos were de-identified and collected for educational purposes.

Results—Benign pathologies: squamous metaplasia, duplicated ureteral orifice, ureterocele, Hutch diverticulum, bladder trabeculation, urachal cyst, interstitial cystitis with and without Hunner's lesion, endometriosis in the bladder, port-wine stain due to Klippel-Trenaunay-Weber syndrome, nephrogenic (mesonephric) metaplasia, and cystitis glandularis (intestinal metaplasia). Malignant pathologies: papillary urothelial neoplasm of low malignant potential (PUNLMP), carcinoma in situ (CIS), high grade urothelial carcinoma, and urachal cancer. Foreign-body pathologies: edema from ureteral stents and stone encrusted mesh.

Conclusion—This video is intended to educate the audience on some incidental bladder findings seen on female cystoscopy. Many pathologies can be biopsied or treated immediately during the procedure hence early urology consultation for most abnormalities is encouraged.

Keywords

anatomy; bladder pathology; cystoscopy; surgical education; urology; education; cystoscopy

Address all correspondence to: Sara M. Lenherr MD, University of Michigan, Department of Urology, 1500 E. Medical Center Drive, 3875 Taubman Center, SPC 5330, Ann Arbor, MI 48109-5330, Telephone: 734-232-4881, Fax: 734-936-9127, slenherr@umich.edu.

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Author contribution: SM Lenherr: project development, video editing, manuscript preparation

EC Crosby: video editing

AP Cameron: project development, video collection, manuscript preparation

Consent

Per Institutional Review Board approval, individual consent was waived as the videos were de-identified and collected for educational purposes.

Aim of video/Introduction

This video will demonstrate three classes of incidental findings on cystoscopy that the gynecologist might find useful. These three classes are (1) benign pathology, (2) malignant pathology and (3) foreign body pathology. All of the following observations should be evaluated by a urologist unless otherwise noted.

Method

Cystoscopic findings were videotaped at the time of routine surgical care. Per Institutional Review Board approval, individual consent was waived as the videos were de-identified and collected for educational purposes.

Results

Part 1: Benign pathology. *Squamous metaplasia:* This might be one of the most common findings encountered on female cystoscopy, here seen on the trigone between the ureteral orifices. It is normal in women and there is no risk for carcinoma. It does not need further evaluation. *Duplicated ureteral orifice:* This is a congenital abnormality usually caused when the ureteral bud splits twice. This typically is only unilateral. The video shows a left sided duplication with ureteral jets of urine out of both orifices. *Ureterocele:* A ureterocele is another congenital abnormality of the ureter. This intravesical ureterocele has a stenotic opening, causing it to balloon (highlighted by intravenous administration of methylene blue in the urine). *Hutch Diverticulum:* This congenital diverticulum is found lateral to the ureteral orifice and is caused by congenitally deficient bladder wall. The video demonstrates a left-sided ureteral orifice with a large lateral diverticulum. *Bladder diverticuli and trabeculation:* Bladder trabeculation is caused by diffuse hypertrophied muscle bundles in the bladder wall. A bladder diverticulum is shown here. *Urachal cyst:* Urachal cysts occur at the dome of the bladder in the remnant urachus between the umbilicus and bladder. They are typically asymptomatic but can develop infection, abscess, intermittent drainage into the umbilicus or adenocarcinoma. *Interstitial cystitis with post hydrodistention glomerulizations:* This patient is undergoing a hydrodistention of the bladder at 80cm of water pressure under anesthesia. The bladder looked perfectly normal prior to filling. The pinpoint petechial hemorrhages that develop throughout the bladder after drainage and reinspection are known as glomerulizations. Glomerulizations are not specific for interstitial cystitis (IC) but are only considered significant if seen in conjunction with diagnostic symptoms for IC. *Interstitial cystitis with Hunner's lesion:* While these are frequently referred to as Hunner's ulcer, they are not actually a ulcer but a mucosal lesion found in some forms of IC. The video demonstrates a well-defined erythematous lesion located on the left lateral bladder wall with a white eschar in the middle. *Severe interstitial cystitis (biopsy proven):* This bladder mucosa demonstrates patchy erythematous areas, concerning for malignancy. Biopsy multiple times demonstrated inflammation without malignancy and the patient's symptoms, consistent with IC, have responded well to bladder installation therapy. *Endometriosis in the bladder:* Ectopic endometrial tissue can be found outside the uterus, but is rarely in the bladder. This patient had a prior hysterectomy for endometriosis. The cystoscopy was performed for chronic pelvic pain and presumed IC. An MRI demonstrated

the endometrioma was invading into the bladder and required a partial cystectomy for therapy. *Port wine stain*: This rare finding is caused by a capillary malformation, typically in the skin, but can be encountered in the bladder. This patient was known to have Klippel–Trénaunay–Weber syndrome, so this abnormality in the bladder was not biopsied. She was asymptomatic and cross-sectional imaging confirmed the vascular malformation continued external to the bladder. *Nephrogenic Metaplasia*: This polypoid papillary lesion is found throughout the bladder. This is an extremely severe case of nephrogenic, otherwise known as mesonephric, metaplasia. These papillary and cystic structures are composed of small hollow tubules. It is a rare finding and the etiology is unclear but most patients present with lower urinary tract symptoms. *Cystitis glandularis (intestinal metaplasia)*: These polypoid lesions are within the sub mucosa and can have goblet cells that produce a mucin-like colonic epithelium. Part 2: Malignant pathology. *Papillary Urothelial Neoplasm of Low Malignant Potential*: This lesion, known as a PUNLMP, is an exophytic pre-malignant lesion. The video demonstrates delicate slender fibrovascular cores for each stalk with very few branches. *High grade superficial urothelial cancer (Ta)*: This is also an exophytic lesion but is it a non-invasive papillary carcinoma. It is more complex appearing with more branching. *Carcinoma in situ (CIS)*: This lesion, on the posterior and lateral wall is a superficial, high grade urothelial cancer. CIS is often described as a red velvety lesion, and is very subtle. Only with biopsy can malignancy and stage be determined. An additional video clip demonstrates a more severe example of CIS, with active bleeding at the dome of the bladder from the CIS lesions and there is evidence of prior biopsy scars on the right lateral wall. *High grade urothelial carcinoma*: These are examples of larger papillary urothelial cancers. These lesions are high grade and require transurethral resection for accurate staging. Some of these long-standing lesions are encrusted with stones. *Urachal adenocarcinoma*: The urachal cyst seen previously in this video can sometimes have an epithelium-lined lumen. This uncommonly gives rise to urachal adenocarcinoma which can be very aggressive. This lesion, at the dome of the bladder, was confirmed to be urachal adenocarcinoma. Part 3: Foreign body pathology. *Edema from ureteral stents*: Edema commonly develops from ureteral stents of even a short duration and do not require biopsy. This will resolve with removal of the stent. *Stone encrusted mesh*: Mesh in the lumen of the bladder can be asymptomatic and incidentally discovered. With time, these become encrusted with stones. The video clips demonstrate various types of mesh encountered in different locations in the bladder.

Conclusion

Many incidental pathologies can be encountered on routine cystoscopy. Most patients will be asymptomatic or have only non-specific complaints. Pan-cystoscopy of the bladder is critical when documenting the bladder has been evaluated. Finally, many pathologies can be biopsied or treated immediately during the incident procedure. Therefore, early urology consultation for any abnormalities is encouraged.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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References

1. None