MULTIDETECTOR COMPUTED TOMOGRAPHY CYSTOGRAPHY AND VIRTUAL CYSTOSCOPY VERSUS CONVENTIAL CYSTOSCOPY IN EVALUATION OF URINARY BLADDER MASSES

By

Abdullah Hussein and Khalid Gadullah*

Departments of Radiodiagnosis and Urosurgery* - Faculty of Medicine (for Girls),
Al -Azhar University

ABSTRACT

Background: Bladder carcinoma is the most common tumor among the low urinary tract, accounting for 90% of cancer cases. Conventional cystoscopy does not provide information about extravescical extensions of the tumor. Multi-detector computed tomography cystography (MDCTC), combined with virtual cystoscopy, is mandatory for tumor, lymph node and metastases staging, and also is useful when conventional cystoscopy is inconclusive or cannot be performed.

Objective: Evaluation of the accuracy of 160-MDCT cystography and virtual cystography versus convention cystoscopy in diagnoses of urinary bladder masses

Patients and methods: This study included seventy patients referred from the inpatient and outpatient clinic of Damietta and Al-Zahraa Urology Departments, Al-Azhar University Hospitals for 160-MDCT cystography and virtual cystoscopy examination, over a period from October 2014 to October 2016. Patients were fifty one males and nineteen females, their ages ranged from eighteen to eighty years, and the mean age was fifty eight years.

Results: Convention cystoscopy detects eighty seven urinary bladder lesions while eighty three lesions identified in MSCT MPR & virtual cystoscopy when used together, while eight lesions detected with MSCT MPR and eighty two with virtual cystoscopy when used separable from each other. Their diameters ranged from 5-mm to 35-mm. Morphological classification were fifty two polypoid lesions and thirty five sessile. The histopathological examination of fifty eight malignant lesions in fifty one patients: Fifty lesions were transitional cell carcinoma, four lesions of squamous cell carcinoma, two lesions carcinoma in situ and two lesions of small cell carcinoma. In addition, twenty nine benign lesions were detected in nineteen patients: Eighteen lesions were polypoidal cystitis, eight were bilharzial, and three were papilloma.

Conclusion: MDCT cystography and virtual cystoscopy were non-invasive technique for primary diagnosis of urinary bladder lesion and extravesical extension, but still convential cystoscopy was the method of choice for biopsy.

Key words: Bladder carcinoma, conventional cystoscopy (CC) and multi-detector computed tomography cystography (MDCTC), virtual cystoscopy (VC).

INTRODUCTION

Bladder cancer is the second most common genitourinary malignancy, the fourth most common male cancer accounting for 7% of all cancers, and has the eighth highest cancer-related mortality rate worldwide (**Aldousari and Kassouf, 2010**). Therefore, close monitoring of the

patients is required at regular intervals. The mainstay of diagnosis and follow-up of bladder neoplasia as of now is conventional cystoscopy **(Jemal et al., 2004)** but it is an invasive procedure. Replacing invasive diagnostic procedures with noninvasive sensitive and specific imaging techniques is a growing trend in medicine today. With computer assisted rapid image acquisition and three-dimensional image reconstruction by commercially available software, virtual reality imaging has been developed. This can be applied to many organs including the colon, stomach, bronchus, and bladder **(Sun-Young et al., 2012)**. About 75–80% of all bladder cancer cases are diagnosed as non-muscle-invasive bladder cancer (NMIBC) **(Kassouf et al., 2010).** Transurethral resection of bladder tumor (TURBT) eradicates all visible tumors and provides tissue for pathological analysis and determination of histological type, grade, and depth of invasion **(Aldousari and Kassouf, 2010).** The endoscopic navigator system [virtual endoscopy (VE)] is a safe, non-invasive tool that enables endoluminal navigation through hollow organs, including urinary tract **(Battista et al., 2009).**

The present work aimed to evaluate the accuracy of 160-MDCT cystography and virtual cystography versus convential cystoscopy in diagnosis of urinary bladder masses.

PATIENTS AND METHODS

Between October 2014 to October 2016, seventy registered patients (51 males and 19 females, their ages ranged from eighteen to eighty years and the mean age was 58 years) presented with gross painless hematuria with recent diagnosis of urinary bladder mass using ultrasound and excretory urography referred from the inpatient and outpatient clinics of Urology Department, Damietta and Al-Zahraa hospitals, Al-Azhar university for MDCT cystography and virtual cystoscopy. The study was approved by the hospital ethics committee and informed consents were obtained from all patients shared in the study.

Inclusion criteria: Patients with urinary bladder masses.

Exclusion criteria: Patients with allergy to contrast media or renal failure.

All patients were subjected to the following:

A. History and clinical examinations.

B. Laboratory investigations:

    1- Complete blood picture (CBC), anti bilharzial antibodies (IHA) titre

    2- Renal function tests.

C. Multidetector computed tomography cystography (MDCTC) and virtual cystography (VC). 160 MDCT cystography and virtual cystoscopy were performed for forty patients before conventional cystoscopy, and in 30 cases after the cystoscopic procedure. All CT examinations were performed with a 160-MDCT scanner (Aquilion Prime, Toshiba Medical Systems).

Technique of the virtual cystoscopy;

A. Air filled technique of the CTVC: 12-F was used through placement of Foley catheter and the bladder was then insufflated with 300-500 ml of carbon dioxide through the Foley catheter according to patient tolerance.

B. Technique of virtual cystoscopy of the contrast material- filled bladder: This technique began with intravenous injection of 120 ml of contrast material. After acquiring data, the processed data set were rendered for visualization of which there are many available, multiplanar reformation (MPR).

D. Conventional cystoscopy: Conventional cystoscopy with a flexible cystoscope (Karl Storz) was performed on all patients in a private hospital, within 2 weeks of MDCT and virtual cystoscopy and the suspicious lesions were biopsied and confirmed with histopathology. Patients with stricture urethra were excluded.

Statistical analysis of the current study was conducted by SPSS V17. The diagnostic accuracy of virtual cystoscopy in detection of bladder masses and mucosal changes were compared with convential cystoscopy as the standard for reference through Chi square tests. P value < 0.05 was considered significant.

RESULTS

Seventy patients who were subjected to the MDCT, after air insufflation, with virtual cystoscopy reconstruction, then convential cystoscopy examination, and guided biopsies were taken and confirmed by histopathologically. Those seventy patients include: fifty one males and nineteen females. Their ages ranged from eighteen to eighty years and the mean age was fifty eight years (Table 1).

Table (1): Age and sex distribution of the 70 patients of the present study**.**

Age groups	Sex		Total No
	Male	**Female**	
18-30	2	0	2
40-50	3	2	5
50-60	26	7	33
60-70	15	6	21
>70	5	4	9
Total no.	51	19	70

Males were more affected by urinary bladder neoplasm (51/70-72.8%) while females were (19/70- 27.2%).

The diameter of the lesions detected ranged from 0.5 to 5 cm (mean size, 3 cm). Thirty lesions (34%) were 0.5 cm in diameter or smaller, and 58 (65.9%) measured more than 0.5 cm in diameter (Table 2).

Table (2): The number and size of the lesions.

Number of the lesions	Tumor size
30	<5 mm
57	>5 mm

5th and 6th decades age groups were the most affected (33 / 70, 47%). Of those seventy patients, fifty seven patients has solitary mass lesion (81.4%), ten patients had two masses (14.3%), two patients had 3 lesions (2.9) and one patient (1.4%) had 4 masses (Table3).

Table (3): Distribution of eighty seven intravesical masses lesions detected by conventional cystoscopy in seventy patients of this study..

Multiplicity of intravesical lesions	No of patients	No of masses	% of patients
Patients with solitary lesion	57	57	81.4%
Patients had two masses	10	20	14.3%
Patients had three masses	2	6	2.9%
Patients had 5 lesions	1	4	1.4%

Eighty seven intravesical masses were detected in seventy patients by conventional cystoscopy depicted fifty two polypoid lesions and thirty five sessile lesions. MSCT MPR after air insufflation detected 80 lesions (80/87-92%): Fifty one polypoid and twenty nine sessile. CT virtual cystoscopy showed high sensitivity, where it detected eighty two lesions, (82/87-94.2%) included fifty two polypoid and thirty sessile. Combine examination of MDCT MPR with air insufflation and CT VC increased the sensitivity for intravesical masses, depicted 83 lesions (83/87-95.4%): Fifty two polypoid and thirty one sessile. The sensitivity of transverse axial CT with air insufflation and virtual cystoscopy was compared to that of conventional cystoscopy in consideration to the size of the mass lesion seen in (Table 4).

Table (4): Comparison between sensitivity of C.C. and axial CT after air insufflation and V.C. as regards to the size of intravesical mass lesion.

Parameters / Methods	Size of lesion				Total No	Sensitivity (%)	P value
	<5 mm		>10 mm				
	Detect No.	Sensitivity (%)	Detect No	Sensitivity %			
C.C.	28	100%	59	100%	87	100%	
Axial CT after Air insufflation	21	75 %	59	100%	80	92 %	0.584
CT V.C.	23	82 %	59	100%	82	94.2	0.603
MPR and CT VC	24	85.7 %	59	100%	83	95.4	0.682

Table (5): Sensitivity of CT V.C. in comparison to C.C. as regards to the lesion morphology.

No. of detectable lesion / Morphology	C.C. & (Sensitivity %)		CTVC & (Sensitivity %)	
Polypoid	52	100	51	98%
Sessile	35	100	31	88.5%
Total no	87		82	94.2%
P-value	0.603			

Thirty five lesions were located on the lateral wall, twelve lesions on the base, eleven lesions on the anterior wall, twenty three on the dome, and six on the trigon. (Table 6). The sensitivity of detection of the lesions >10 mm was 100% at both axial CT after air insufflation (2D) and CT V.C. Additionally, V.C., CT scanning was well tolerated by all patients, and no complications occurred. Transverse axial scan MDCT detected extravesical tumor infiltration in 5 patients and confirmed histopathologically (Table 6).

Table (6): Anatomical distribution of the eighty seven urinary bladder lesions in seventy patient

Site of urinary bladder lesion	No of lesions	% of lesions
UB lateral wall	35	40.3%
Base	12	13.8%
Anterior Wall	11	12.6%
Dome	23	26.4%
Trigon	6	6.9%

The histopathological examination diagnosis showed fifty eight malignant lesions in fifty three patients, fifty lesions were transitional cell carcinoma, four squamous cell carcinoma, two carcinoma in situ, and two small cell carcinoma. Twenty nine benign lesions were detected in seventeen patients, eighteen were polypoidal cystitis and eight lesions were bilharzial and three lesions were papilloma (Table 7).

Table (7): Histopathological classification of cystoscopic biopsy of the 70 patients of our study.

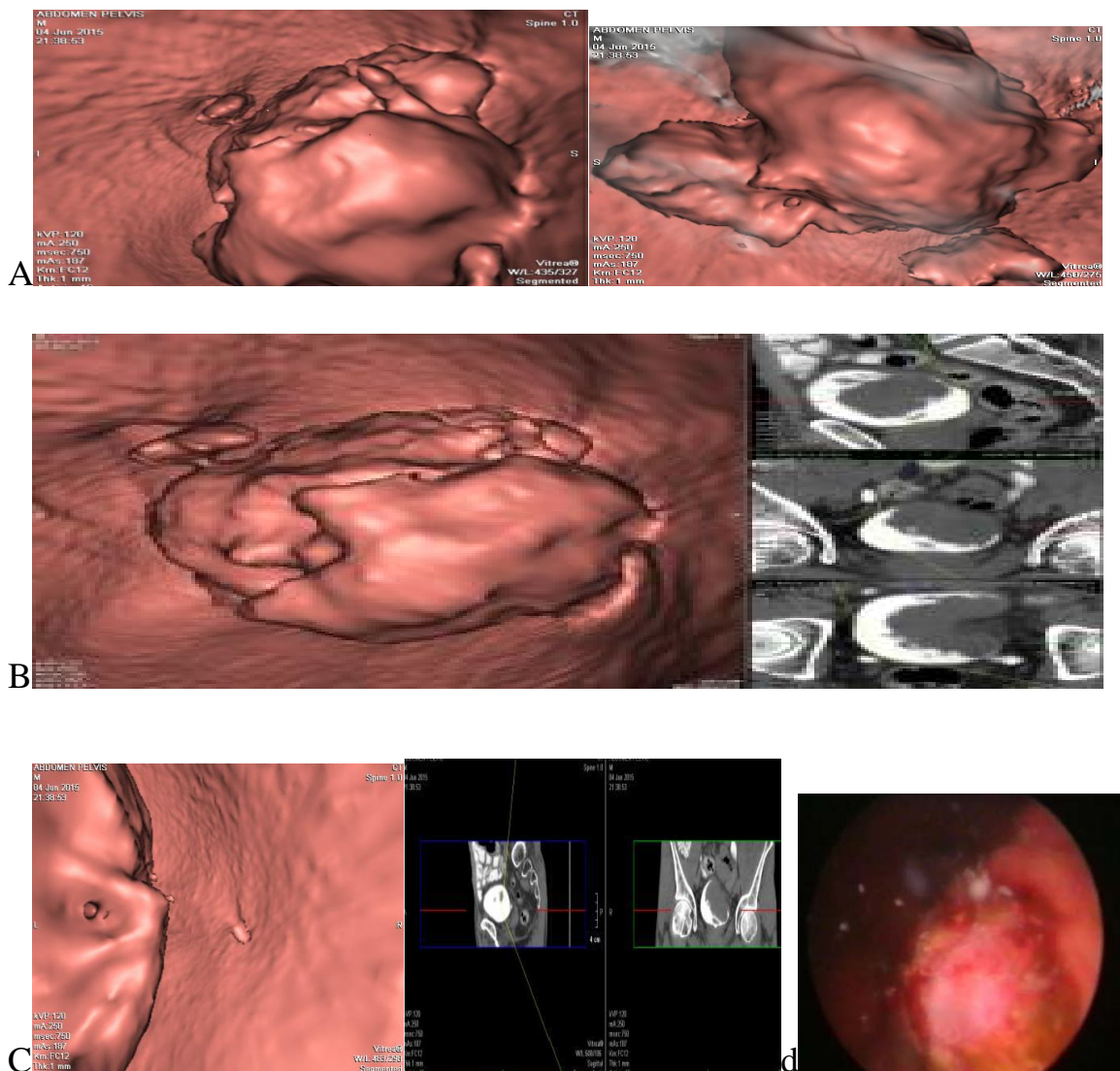| Histopathology	No. of patients	No of lesions	Percentage of patients (%)
(A) Malignant mass lesion	53	58	75.7%
1- Transitional cell carcinoma		50	
2- Squamous cell carcinoma		4	
3- Carcinoma in situ		2	
4- Small cell carcinoma		2	
(B) Benign mass lesion	17	29	24.3%
1- Polypoidal cystitis		18	
2- Bilharzial		8	
3- Papilloma		3	

(Fig. 1-5).

Figure (1) a, b, c & d : 64 years old male patient presenting with hematuria showed bulky fungating solid irregular surface mass lesion of Left lateral wall bulging towards the dome and base measuring 3.5 x 5-cm in both axes. The virtual image clearly defined the cauliflower mass lesion. In addition, small mass polypoidal nodule (5 x 3-mm) at right posterior wall of bladder dome, with dirty perivesical fat (likely infiltrated) and multiple enlarged pelvic lymph nodes. d) Conventional cystoscopy revealed a large intravesical fungating mass in the left posterior U. Bladder. Histopathological examination revealed transitional cell carcinoma (grade IV).
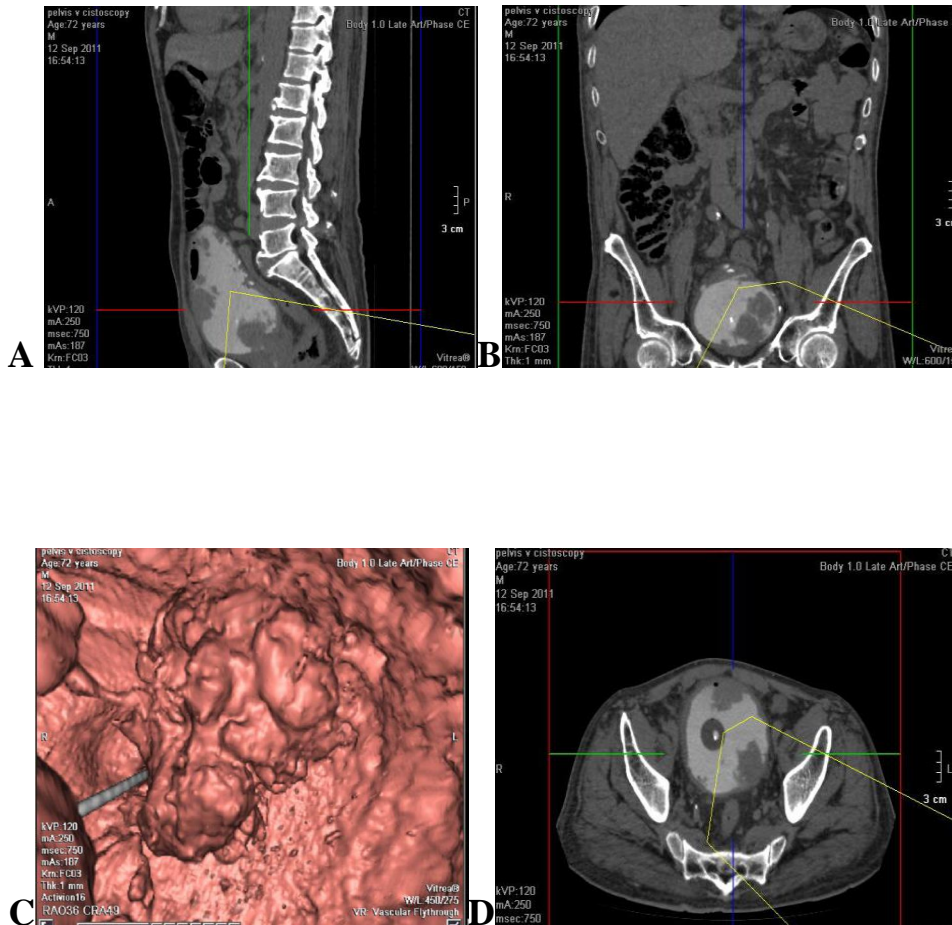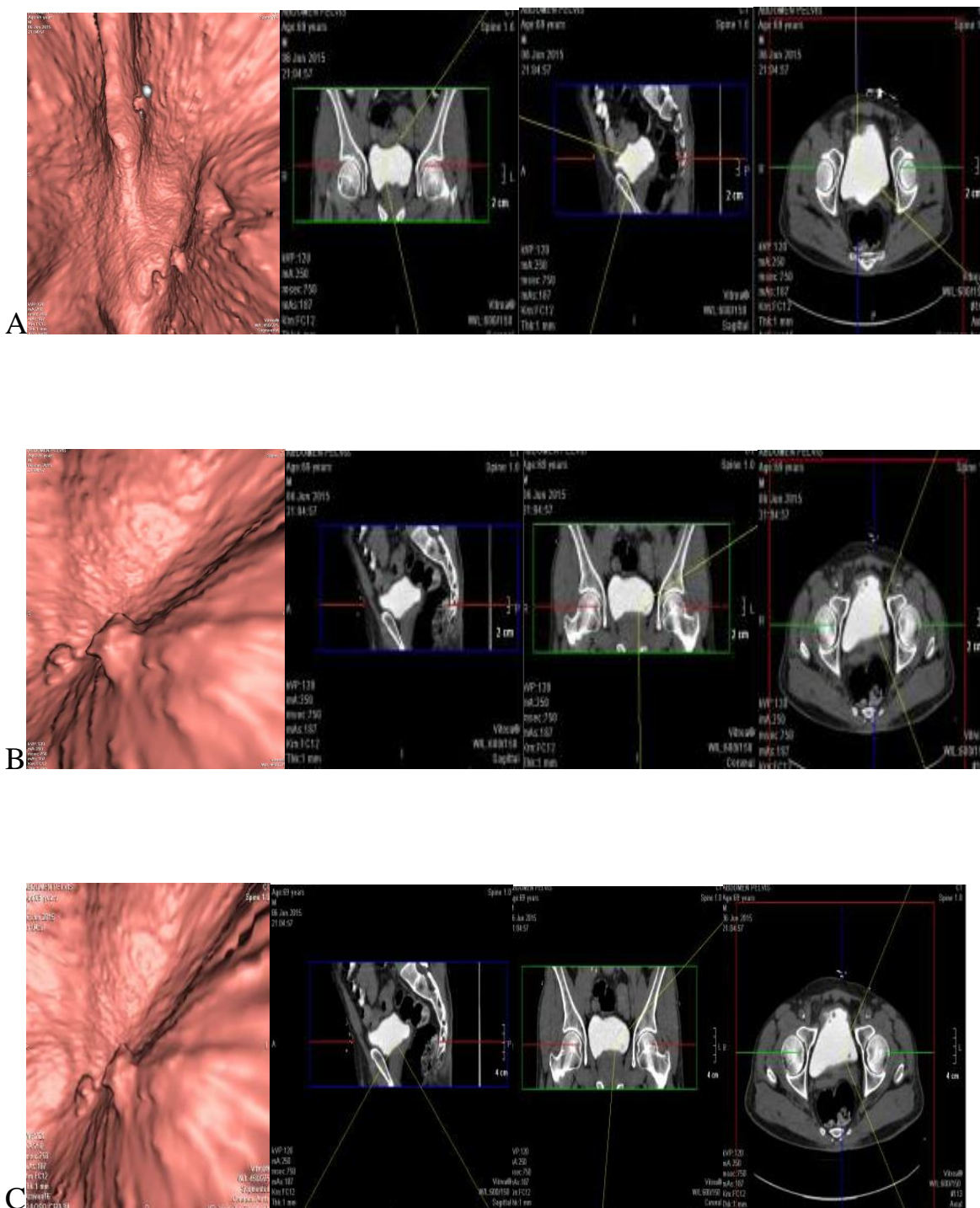
Figure (2) A,B, C & D : 69 years old male presented with attacks of hematuria one year ago showed multiple papillary bladder masses in different sagittal, coronal and axial planes, the average displayed about 35 x 16-mm in both axes with dirty perivesical fat (likely infiltrated) with multiple enlarged pelvic lymph nodes. Additional finding from the axial images was low attenuation solid globular shape hepatic focal lesion, mostly metastatic deposit. Virtual image identified large irregular surface polypoidal mass lesion projecting into the lumen. Biopsy and histopathological examination revealed poorly differentiated transitional cell carcinoma (Grade III).

Figure(3) A, B and C: 66 years old male patient presented by hematuria and loss of weight. Axial and coronal images showed multiple small polypoidal nodules, the average diameter was 4-mm, seen at the right lateral and anterior walls with partial calcification. Virtual cystocystoscopy showed multiple small irregular surface polypoidal nodules in urinary bladder lumen. Biopsy and histopathological examination revealed Transitional cell carcinoma (Grade III).
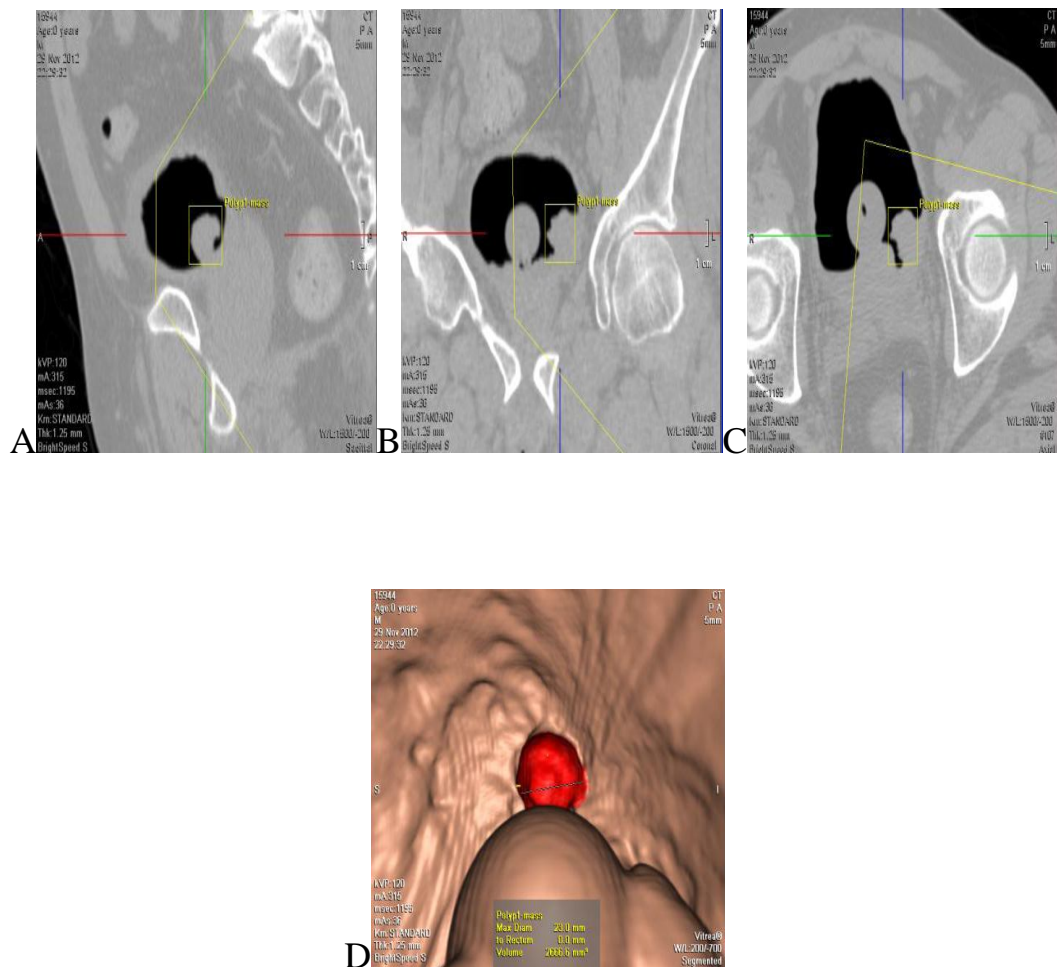
Figure (4): Male 53 year's old patient presented with bladder mass on routine ultrasound examination. Axial, coronal and sagittal images showed single papillary mass at the left posterolateral wall of the urinary bladder, measuring 2.3 cm in long diameter**.** CTV, using the color tagged option, clearly identified the bladder mass. **Conventional cystoscopy** revealed multiple small masses at the bladder base. Core biopsy and histopathology revealed moderately differentiated transitional cell carcinoma. Diagnosis: TCC (Grade II).
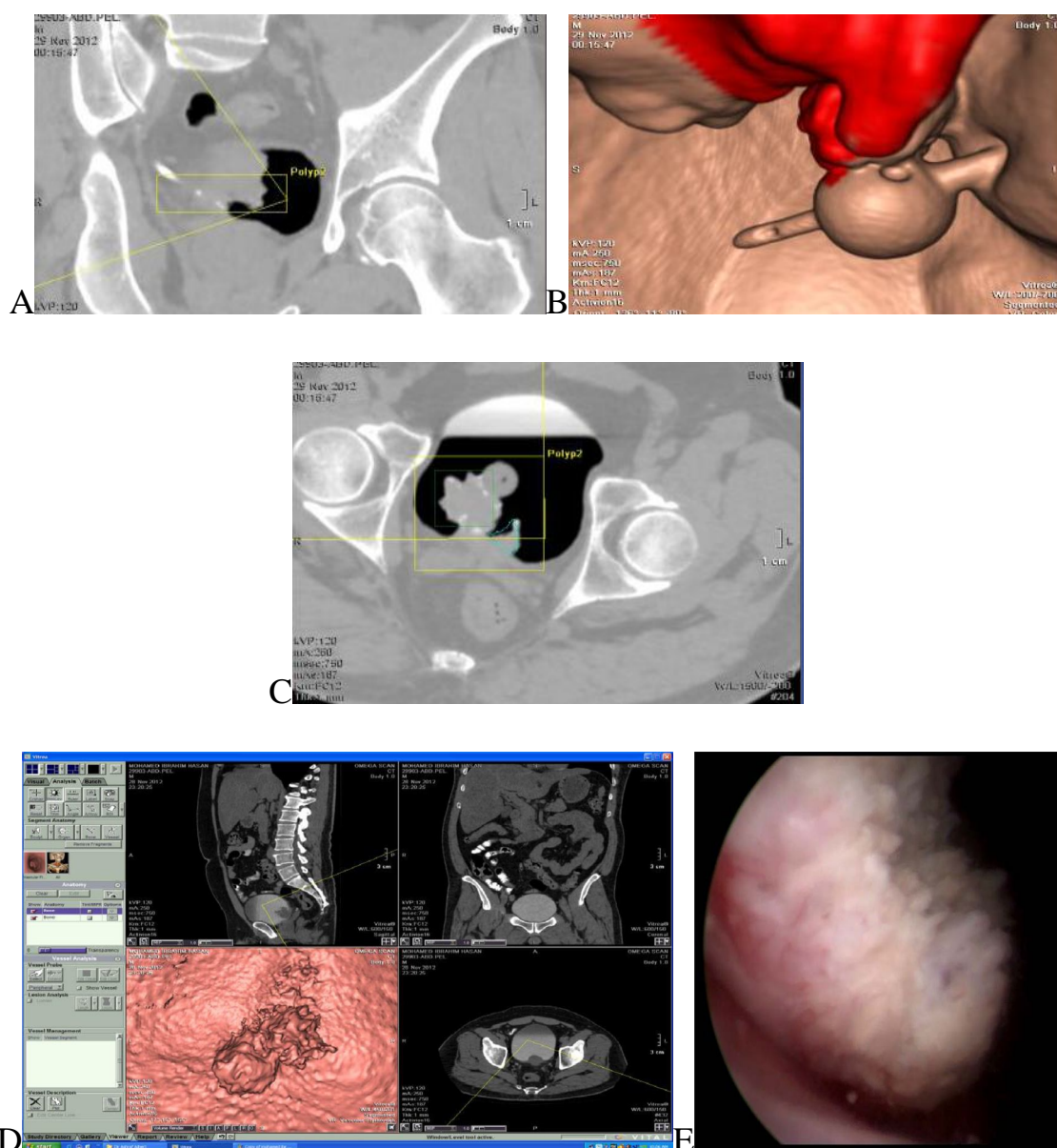
Figure (5): Male 47 years old patient presented with bladder mass on routine ultrasound examination. Axial, coronal and sagittal images showed single irregular shaped polypoidal mass at the trigon urinary bladder, measuring about 3 x 2 cm. CTU and Virtual images using the iodinated contrast filled then the air filled bladder techniques clearly visualized the bladder mass. E) **Conventional cystoscopy** revealed relative large intravesical fungating mass arising from UB trigon. **Diagnosis:** Transitional cell carcinoma (Grade 11).

DISCUSSION

Sachin Abrol et al. (2015) reported that bladder cancer is one of the most common urological malignancies, with the need for long-term follow-up. Because bladder tumors have a tendency towards multifocality and recurrence, it seems very

important to find out diagnostic techniques that are less invasive and at the same time highly sensitive have been used for detecting bladder tumor, none of them may be completely sensitive in all aspects. While overall CT may be a useful radiological tool, its sensitivity appears to be low particularly for detection of small bladder lesions. More negative findings on CT may warrant further evaluation with conventional cystopanendoscopic examination. **Felix et al. (2008)** reported that the most common histopathologic type of urinary bladder cancer in Egypt has been SCC contrary to the leading etiology of smoking and occupational exposures in Western countries. Urinary schistosomiasis has been the most important risk factor in Egypt for bladder cancer. Reduction in schistosomal infection and increase in cigarette smoking and chemical exposure related to occupational hazards have resulted in significantly changing pattern of bladder cancer in Egypt and TCC has become the most frequent form. In the present study 87 intravesical masses in 70 patients by conventional cystoscopy, histopathological examination diagnosis showed 58 malignant lesions in 75.7% of patients, from which 50 lesions were transitional cell carcinoma, 4 squamous cell carcinoma, 2 carcinoma in situ, and 2 small cell carcinoma. Twenty nine benign lesions were detected in 24.3% patients, 18 were polypoidal cystitis and 8 were bilharzial and 3 were papilloma. **Tsampoulas et al. (2008) and Panebianco et al. (2009)** reported that the introduction of 16-64 MDCT scanners significantly improved spatial resolution by the use of thinner slice thickness, collimation, and reconstruction increment, which enable fast execution and high

resolution of the examination. Moreover, these allow acquisition of multiplanar reformatted images (MPR) very similar to that of axial plane. A few studies in literature reported the combined evaluation of CT cystography, MPR, and virtual images increase the performance of the technique especially for the detection of small lesions. CT virtual endoscopy is based on creating high contrast between wall bladder and lumen. This in agree with our study, we used 160 MDCT with high spatial resolution with room air achieving adequate distension technique. Air-filled bladder provided optimal attenuation gradient between walls and lumen leading to differences greater than 1000-HU. The sensitivity of transverse axial CT with air insufflation and virtual cystoscopy was compared to that of conventional cystoscopy. Where we detected 87 intravesical masses in 70 patients by conventional cystoscopy, MSCT MPR after air insufflation detected 80 lesions (80/87-92%). CT virtual cystoscopy showed high sensitivity, where it detected 82 lesions, (82/87-94.2%). Combination of MDCT MPR with air insufflation and CT VC increased the sensitivity for intravesical masses, depicted 83 lesions (83/87-95.4%). So the sensitivity of detection of urinary bladder lesions was increase when used combination of axial MDCT MPR and virtual cystoscopy. **Valeria Panebianco et al. (2009)** reported that CT cystography and VC are less invasive than conventional cystoscopy, and can be used to evaluate areas difficult to assess with cystoscopy such as the anterior bladder neck and narrow-mouthed diverticula. Although uncommon, diverticular carcinoma is difficult to detect at conventional

cystoscopy and has a poorer prognosis than neoplasm that originates within the main bladder lumen owing to earlier transmural invasion. The main disadvantages of CT cystography and VC are the low sensitivity to depict flat lesions (carcinoma in situ), changes in mucosa texture, lack of distinguishing mucosal thickening secondary to fibrosis from a neoplasm, and certainly it lacks the ability to provide tissue for histologic evaluation. **Masahiro Jinzaki, et al. (2007)** reported that the combination of dynamic contrast enhanced imaging and virtual CT cystoscopy may further improve detection of bladder lesions, especially small early or flat tumors, because bladder neoplasms become more enhanced than adjacent normal wall.

CONCLUSION

V.C. has several advantages over C.C. where it is minimally invasive, allowing intraluminal viewing of urinary bladder from any angle, and bypassing any obstruction if present. It allowed also access to some areas which may be sometimes inaccessible by C.C. and its ability to accurately record tumor maximum dimension. CT V.C. has still some limitations. It was unable to depict flat lesions. It lack the ability to provide tissue for histopathology and to identify the origin and nature of bladder mass. So, the complementary interpretation of V.C. and axial CT information was essential, for extravesical extension and urteric infiltration, allowing V.C. to obtain adequate results comparable to those of C.C. V.C. may be an alternative or a complementary examination, where C.C. was difficult to be performed or contraindicated.

REFERENCES

1. **Aldousari S. and Kassouf W. (2010):** Update on the management of invasive bladder cancer. Can Urol Assoc J., 4:56–64.

2. **Battista G1, Sassi C, Schiavina R, Franceschelli A, Baglivo E, Martorana G, Canini R. (2009):** Computerized tomography virtual endoscopy in evaluation of upper urinary tract tumors: initial experience. Abdom Imag., 34:107–12.

3. **Felix AS, Soliman AS, Khaled H, Zaghloul MS, Banerjee M, El-Baradie M, El-Kalawy M, Abd-Elsayed AA, Ismail K, Hablas A, Seifeldin IA, Ramadan M. and Wilson ML. (2008):** The changing pattern of bladder cancer in Egypt over the past 26 years Cancer Causes Control. May;19(4):421-9

4. **Gabr A.H., Elbadry M., Elsherief A. and Tawfiek E.R. (2013):** Computed tomography-virtual cystoscopy in the evaluation of a bladder mass: could it replace standard conventional cystoscopy? Arab J Urol. 11:369–374.

5. **Jemal A, Tiwari RC, Murray T, Ghafoor A, Samuels A, Ward E, Feuer EJ, Thun MJ; American Cancer Society (2004):** Cancer statistics, CA:ACancer Journal for Clinicians, vol. 54,no. 1, pp.8–29

6. **Karabacak O.R., Cakmakci E., Ozturk U., Demirel F., Dilli A. and Hekimoglu B. (2011):** Virtual cystoscopy: the evaluation of bladder lesions with computed tomographic virtual cystoscopy. Can Urol Assoc J., 5:34–37.

7. **Kassouf W., Kamat A., Zlotta A., Aprikian A. (2010):** Canadian guidelines for treatment of non-muscle invasive bladder cancer: a focus on intravesical therapy. Can Urol Assoc J. 4:168-173.

8. **Lalondrelle S., Sohaib S., Castellano I., Mears D., Huddart R. And Khoo V. (2012):** Investigating the relationship between virtual cystoscopy image quality and CT slice thickness. Br J Radiol. 85:1112–1117.

9. **Masahiro J., Akihiro T. Hiroshi S., Yutaka H., Kozo S. Sachio K. and Stuart G. (2007):** Detection of bladder tumors with dynamic contrastenhanced MDCT. AJR, 188:913–918.

10. **Panebianco V1, Osimani M, Lisi D, Santucci E, Ciccariello M, Iori S, Catalano C and Passariello R. (2009):** 64-detector row CT cystography with virtual cystoscopy detecting bladder carcinoma: preliminary experience in selected patients. La Radiologia Medica 114(1):52-69]

11. **Sachin Abrol, Ankush Jairath, Sanika Ganpule, Arvind Ganpule, Shashikant Mishra, Ravindra Sabnis, and Mahesh Desai (2015):** Can CT Virtual Cystoscopy Replace Conventional Cystoscopy in Early Detection of Bladder Cancer?. **Advances in Urology Volume 2015, Article ID 926590, 6 pages**

12. **Sun-Y. Chung, Seong H., Seung S., Ju Hee L., Ah Y., Su-Kil P., Duck J. , and Hyun K. (2012):** Comparison between CT Colonography and Double-Contrast Barium Enema for Colonic Evaluation in Patients with Renal Insufficiency Korean J Radiol., 13(3): 290–299.

13. **Tsampoulas C., Tsili A., Giannakis D., Alamanos Y., Sofikitis N. and Efremidis S.C. (2008):** 16-MDCT cystoscopy in the evaluation of neoplasms of the urinary bladder. AJR Am J Roentgenol. 190:729–735.

14. **Valeria P., Alessandro S., Michele D., Silvia B.,Valeria V., Alessandro G., Carlo C., and Roberto P. (2010):** Bladder carcinoma: MDCT cystography and virtual cystoscopy Abdom Imaging, 35:257–264.

الأشعة المقطعية متعددة الشرائح والمنظار التقديري التخيلي مقارنة بالمنظار التداخلي لتقييم كتل المثانة البولية

عبد الله حسين ـ خالد جاد الله*

قسمى الأشعة التشخيصية وجراحة المسالك البولية* ـ كلية طب البنات ـجامعة الأزهر

خلفية البحث: أدت التطورات الأخيرة في مجال الأشعة المقطعية و التي تتضمن تطور برامج الكمبيوتر المشغلة لأجهزة الأشعة المقطعية إلى إستخدام التصوير المقطعي ثلاثي الأبعاد مع تقنيات إعادة بناء الصور و تركيبها، وهو ما أدى إلى سهولة و يسر في إستخدام الأشعة المقطعية و كذلك المنظار التقديري (التخيلي) لتصوير المسالك البولية.

ويتطلب الحصول على نتائج مثالية للأشعة المقطعية والمنظار التخيلي إستخدام جهاز أشعة مقطعية ذو قدرة على التصوير بمقاطع رفيعة وعالية النقاء بالإضافة إلى عدة بروتوكولات وتطبيقات للحصول على صور ثلاثية الأبعاد. ويعتبر فحص المسالك البولية بالأشعة المقطعية بالتصوير ثلاثي الأبعاد ذا أهمية كبيرة لإيضاح الوصف التشريحي للمسالك البولية، وأدق التغيرات التي تطرأ عليها عند الإصابة بالآفات المختلفة.

الهدف من البحث: تقييم دور المنظار التخيلي على المسالك البولية مقارنه بالمنظار التداخلي حيث تعتبر المثانة من الأعضاء المثالية لهذا النوع من الفحص، وذلك لبساطة شكلها التشريحي وصغر حجمها نسبياً وعدم وجود حركات لاإرادية بها.

المرضى و طرق البحث: تم عمل هذه الدارسة في الفترة من يناير 2014 ، إلى ديسمبر 2016 ، وشملت سبعين مريضا بكتل في المثانة البولية: واحد وخمسين ذكوراً (72,8٪) و19 إناثاً (27,2٪) ،وتراوحت أعمارهم بين 18-80 سنة من العمر.

وقد خضع جميع المرضي للتالي:

1- التاريخ المرضي والفحص السريري.

2- الفحوص المعملية.

3-التصوير بالأشعة المقطعية بحقن المثانة هواء أو بالصبغة و عمل منظار تقديري للمثانة.

4- عمل منظاري تداخلي.

النتائج: وجد أن ستين مريضا مصابون بكتل المثانة، من بينهم واحد وخمسين مريضاً يعانون من ثمانية وخمسين ورماً سرطانياً، وتسعة مرضى يعانون من كتل حميدة، بينما العشرة الباقين من المرضى طبيعيين. وبمقارنة فعالية كل وسيلة على حدة في التشخيص وجد أن القيمة الإحتمالية لحساسية الأشعة المقطعية والمنظار التخيلي أقل مما لو استخدمنا الوسيلتين معا.

الاستنتاج: يجب الجمع بين الأشعة المقطعية على المسالك البولية والمنظار التخيلي لتقييم المثانة وخصوصاً في الحالات التي لا ينصح بعمل المنظار التداخلي لها، أو الحالات التي يصعب عمل منظار تداخلي لها، وكذلك لمتابعة المرضى عقب إجرائهم العمليات الجراحية. وفي هذه الحالات، من الممكن أن توفر هذه التقنيات على المريض مشقة عمل المنظار التداخلي. وفي حالات الضرورة الطبية لأخذ العينات من الأورام أو إستئصال الأجسام الغريبة (كالحصوات) فإن المنظار التداخلي سيظل هو الوسيلة المناسبة.