Urinary bladder neoplastic masses findings through Multidetector-row CT urography

Thesis

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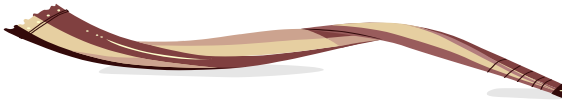

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List of Abbreviations

Abb.		Full Term
3D	:	Three-dimensional reformatting techniques
CE	:	contrast enhanced
CIS	:	Carcinoma in situ
CMP	:	Corticomedullary phase
CT	:	Computed tomography
CTU	:	CT urography
DRE	:	digital rectal examination
EP	:	excretory phase
FDA	:	Food and Drug Administration.
FDG	:	Fluorodeoxyglucose
G	:	grade.
HG	:	High-grade
I V	:	Intravenous
IVU	:	Intravenous urography
LG	:	Low-grade
MDCT	:	multi-detector computed tomography
MIP	:	maximum intensity projection
MR	:	magnetic resonance
MRP	:	Multi/ curved planar reformatting
MSCT	:	multislice CT
NP	:	Nephrographic phase
PET	:	Positron emission tomography
PUNLMP	:	Papillary urothelial neoplasm of low malignant potential
PV	:	vaginal examination
SCC	:	squamous cell carcinoma
SDCT	:	single detector CT.
SSD	:	shaded surface display
TCC	:	transitional cell carcinoma

List of Abbreviations

Abb.		Full Term
TNM	:	Tumor, Node, Metastasis
TURB	:	transurethral resection of bladder
UB	:	urinary bladder
UC	:	urethral carcinoma
UE	:	unenhanced phase
UICC	:	Union International Control Cancer
US	:	Ultrasonography
UTUC	:	upper tract urethral carcinoma
UVJ	:	uretrovesical junction
VC	:	virtual cystoscopy
VR	:	volume rendering
WHO	:	World Health Organization

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Abstract

Background: Urinary bladder carcinoma is one of the most common tumors among the lower urinary tract, it is the seventh common malignancy and widely distributed in developed countries.

Aim of the Work: to elucidate the diagnostic potential and additive imaging data obtained with multi-detector computed tomography (MDCT) in early detection and characterization of urinary bladder neoplastic masses by comparing the result of the study with the conventional cystoscopy results.

Patients and Methods:

This prospective descriptive study was conducted on forty patients, 36 was men and 4 women. The Patients referred to radio-diagnosis department, Ain Shams University hospitals, radio-diagnosis department in a period 6 months of data collection for suspicious bladder mass(es) after clinical assessment of patient or for further characterization of indeterminate bladder neoplastic mass lesion previously depicted on other radiological investigation as ultrasound examination.

Results: a statistically significant difference was found between positive and negative cystoscopic biopsy results for malignancy in relation to presence CT features of malignancy

Conclusion:

MDCT urography is useful for examination of patients especially when the CC is contraindicated such as hemorrhage, perforation, difficult to doing it or unsatisfactory in interpretation, and as a complementary technique in the evaluation of areas difficult to evaluate with CC, especially with the MDCT results satisfactory in finding lesions smaller than 5mm. MDCT urography gives us an opportunity for early detection bladder tumors because its reliability and accuracy and our results support that.

Key words: Urinary bladder neoplasm, Multidetector-row CT urography

Introduction

Pathologic conditions of the urinary bladder could manifest as a focal mass or diffuse urothelial wall thickening. Focal masses might be neoplastic or could develop sequent to congenital, inflammatory, idiopathic, or infectious processes. Clinical, macroscopic, and radiologic findings for these masses may superimpose; therefore, histologic interrogation is often a necessity ***(Wong-You–Cheong et al., 2006)***. Benign mass lesions are uncommon; however, some can be suggested by their imaging criteria ***(Dighe et al., 2011).***

Urinary bladder carcinoma is a heterogeneous disease with a variety of pathologic features, cytogenetic characteristics, and natural histories whereas the most common clinical presentation is gross painless hematuria ***(Amin and Abd El-Hamid, 2012).*** In Egypt, urinary bladder carcinoma is the most prevalent malignancy among Egyptian males (19%), giving rise to 15.6% of cancer-related deaths that formerly has been assigned to Schistosoma infection, a considerable risk factor for squamous cell carcinoma (SCC). Latterly, transitional cell carcinoma (TCC) incidence has been rising up as a sequence of heavy cigarette smoking, occupational exposures to carcinogens, while SCC has lessened ***(Fedwa et al., 2009).*** In Egyptian females, UB carcinoma is the seventh common malignancy (3.8%), bringing about 3.7% of cancer-related deaths ***(Gabr et al., 2013).***

Early depiction of UB carcinoma is of paramount importance, since up to 47% of UB cancer–related mortalities may have been

averted***(Cha et al., 2015).***Precise preoperative staging is the most important element in delineating the appropriate management of UB carcinoma in view of fact that the therapeutic strategy selected and prognosis rely on the clinical and radiological stage at presentation ***(Tekes et al., 2005).*** Moreover, UB carcinoma has a high recurrence rate, necessitating long-term surveillance following initial therapy ***(Verma et al., 2012).***

Conventional cystoscopy is the mainstay of diagnosis and follow-up of UB neoplasia ***(Karabacak et al., 2011).*** Nonetheless, it's famed as an invasive, expensive, time-consuming technique, coupled with urinary tract infections in 5–15%of patients**.** Another drawback of cystoscopy is the relatively low reported sensitivity of 87% for detection of UB tumors ***(Sfetsas and Mitropoulos, 2016).***

Clinical staging of UB carcinoma based upon bimanual assessment of tumor bulk and adhesion to nearby structures proved to be imprecise, with an inaccuracy rate of 25%–50%. Thus, accurate detection and staging are the principal objectives of radiologists in evaluation of patients with UB cancer ***(Kim et al., 2004).***

Computed tomography (CT) and magnetic resonance (MR) imaging are the principal radiologic modalities utilized in assessment of patients with UB cancer. The inherent advantages of CT encompass shorter acquisition time, wider coverage in a single breath hold adding to multiplanar capability. Contrariwise, CT is limited in the characterization of small and early stages of UB cancers, whilst its

staging accuracy ranges from 64% to 92%. Furthermore, the enhancement pattern of UB carcinoma regarding peak enhancement time and degree of enhancement on contrast material–enhanced CT images has not been analyzed. It is known, however, that bladder cancers usually enhance more intensely than nearby normal UB wall tissue ***(Kim et al., 2004).***

In the last decades; recent advances in CT hardware coupled with commercially available software had led to the development of the multi–detector row helical CT scanner, which could provide higher resolution and more compact volume acquisition in a shorter time with anticipated improvement in evaluation of patients with UB carcinoma ***(Kim et al., 2004).***

Aim of the study

The aim of this study is to elucidate the diagnostic potential and additive imaging data obtained with multi-detector computed tomography (MDCT) in early detection and characterization of urinary bladder neoplastic masses by comparing the result of the study with the conventional cystoscopy results.