

BLADDER WALL THICKNESS IN COMPUTED TOMOGRAPHY CORRELATED WITH THE SEVERITY OF INFLAMMATION IN BLADDER PAIN SYNDROME

Hypothesis / aims of study

Bladder pain syndrome (BPS) could be classified to several different subtypes such as ulcer type interstitial cystitis/bladder pain syndrome (IC/BPS), non-ulcer IC/BPS or ketamine cystitis (KC). The patients with BPS usually have similar symptoms, but there is lacking a good objective evaluation or differential diagnosis tool for BPS. Few bladder image studies were conducted for BPS. Current study was designed to investigate the clinical value of computed tomography (CT) in BPS.

Study design, materials and methods

The patients who were diagnosed as BPS were prospectively recruited into this study. The patients would receive complete history taking including pain visual analog scale (VAS), and the functional bladder capacity (FBC) was also recorded. The patients would receive cystoscopic hydrodistention under general anesthesia, and the maximal bladder capacity (MBC) during the operation would be recorded. The patients would be asked to hold urine before receiving CT, and the abdominal to pelvic CT with contrast would be performed by the radiologist. The intravesicle bladder width, high, and length would be measured at the section with maximal bladder size. The bladder volume was calculated according to the formula intravesicle bladder height × bladder depth × bladder width × 0.52. The bladder wall thickness would be measured at the middle point of bladder anterior wall at the section with maximal bladder size. Bladder CT images of the patients with renal cancer were also investigated for control subjects.

Results

A total 21 patients with bladder BPS were recruited and completed this study. Nine patients, 7 patients and 5 patients were diagnosed as ulcer type IC/BPS, non-ulcer IC/BPS and KC, respectively. The clinic data and bladder CT image results were listed in the Table 1. The bladder wall in the patients with KC was significantly thicker than that in the others, and diffuse thickening of bladder wall was presented in every patient with KC (Fig. 1A). Focal bladder wall thickening was also found in 8 of the 9 patients with ulcer type IC/BPS (Fig. 1B), the mean thickness of the focal thickening is 9.31 ± 1.66 mm. And the location of focal bladder thickening was compatible to the cystoscopy finding of Hunner's lesion in the patients with ulcer type IC/BPS. The bladder CT in the patients with non-ulcer IC/BPS did not reveal specific finding (Fig. 1C). The bladder wall thickness was significantly correlated with MBC ($p=0.008$, $R^2=0.312$). The bladder wall thickness also had tendency to correlated with FBC ($p=0.09$, $R^2=0.145$).

Interpretation of results

The patients with ulcer type IC/BPS, non-ulcer type IC/BPS and KC had different findings in the bladder CT. This might suggest different severity of bladder inflammation among these patients. The bladder wall thickness is correlated with the clinical symptoms including MBC and FBC. This might suggest bladder CT might be useful for evaluation of bladder inflammation severity in the patients with BPS.

Concluding message

Bladder CT is useful for severity evaluation and differential diagnosis in the patients with BPS. The bladder wall thickness might be correlated with the severity of symptoms and bladder inflammation.

Table 1. Clinical parameters and bladder CT image data in the patients with BPS

	Ulcer type IC/BPS (N=9)	Non ulcer IC/BPS (N=7)	KC (N=5)	Controls (N=10)	p-value
Age	62.22±9.70	48.29±14.13	26.80±5.89	56.32±18.16	<0.001
VAS	8.56±1.13	4.57±1.51	9.00±1.00	N/A	<0.001
FBC (mL)	143.6±69.7	278.6±125.1	94.0±26.1	N/A	0.004
MBC (mL)	444.44±98.2	678.6±106.5	150.0±35.4	N/A	0.000
Width (mm)	70.0±11.4	81.6±10.7	51.2±8.8	68.16±14.55	0.001
High (mm)	49.7±7.8	49.1±20.9	43.2±9.7	53.06±15.22	0.037
Length (mm)	39.6±6.1	51.6±11.5	43.0±18.9	46.65±16.79	0.129
Volume (mL)	71.7±19.4	115.4±52.5	49.8±28.6	93.65±51.79	0.020
Bladder wall Thickness(mm)	4.2±2.8	2.9±0.7	8.9±4.6	3.2±3.3	<0.001

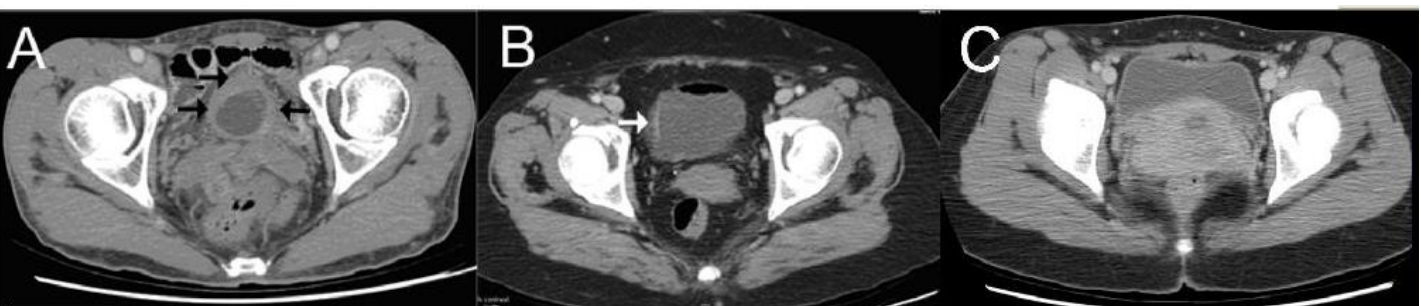


Fig. 1. Bladder CT image in the patients with KC, ulcer type IC/BPS and non-ulcer IC/BPS. (A) Bladder CT in the patients with KC revealed diffuse bladder wall thickening (black arrow). (B) Bladder CT in the patients with ulcer type IC/BPS revealed right lateral wall focal thickening (white arrow). (C) Bladder CT in the patients with non-ulcer type IC/BPS revealed no specific finding.

Disclosures

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