

# Metastasis to gluteal muscle from high grade transitional cell carcinoma of bladder. Report of a case and review of literature

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## Key words

Muscle metastasis • High grade Tcc

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## Summary

High grade bladder malignancies have tendency to local and distant invasion. The most commonly involved sites are lymph nodes, lungs, bone and liver. Muscle metastases are generally rare and have been described in few cases of Genito-Urinary

cancer. In this work we describe a rare case of high grade transitional cell carcinoma from bladder metastasising to the left gluteal muscle together with the review of the pertinent literature.

## Case Report

A 66 years old gentleman was admitted in the A&E Department approximately 3 years earlier for acute urinary retention and epididymo-orchitis. His past medical history was significant for previous groin strain and limited mobilization with occasional use of a walking stick and wheelchair. The patient was treated with antibiotics, catheterisation and hydration and booked for an elective TURP and cystolitholapaxy which were performed after 2 months. The histology examination on the prostate sample revealed the presence of benign prostatic hyperplasia, chronic inflammation and calcifications.

The patient came back under medical attention in A&E 2 years later for dysuria, urge incontinence and abdominal pain. Non visible hematuria was also present. Blood pressure and blood cultures were within normal limits. The physical examination showed a palpable suprapubic mass. The catheterization revealed a blood stained residual of 30ml in the bladder. The subsequent cystoscopy showed a large and calcified solid mass in the anterior wall of the bladder partially covered in blood clots. It was not possible to proceed with a complete cystectomy or resection of the mass for the significant comorbidity (bilateral hip deformity of arthritic nature) and because the patient was not keen to lose his bladder. The urine cytology was positive blood and atypical cells suspicious for malignancy.

The histology examination performed on the TURBT sample showed the presence of a partially calcified high grade (G2-G3) transitional cell carcinoma with infiltration of lamina propria. The superficiality of the specimen, depending on the technical difficulties on sampling a hemorrhagic and partially calcified mass, hampered the assessment of the invasion in the muscle layers.

The staging imaging did not show any evidence of metastatic disease, so the patient was conservatively treated with cycles of BCG intravesical instillation. No further active therapies were started.

6 months later the patient presented with a 2 weeks story of intense pain in groins and lower limbs with inability to mobilize. The patient also noticed the presence of a superficial solid mass in the left gluteal muscle. The US examination showed a 3.4 x 3.7 x 2.6 hypoechoic mass which was aspirated, but no fluid was obtained. Arrangements for a diagnostic needle biopsy and for a new staging were therefore made. The CT showed a significant progression of the disease. The tumour spread locally in the perivesical soft tissues and gave multiple lymphadenopathies and masses in mediastinum, pleura, lungs and left adrenal gland. X-Rays also showed multiple destructive lesions in pelvis and femours. The MPR of the left gluteal muscle contained a 156 x 68 mm low-density mass with loss of the original arrangement of the muscle fibers (Figs. 1-2-3).

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Fig. 1. CT scan of the calcified lesion in the bladder.

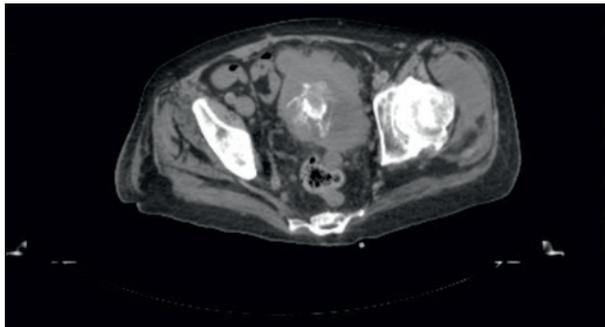


Fig. 2. CT scans of the multiple metastases in abdominal cavity (A), mediastinum (B), lungs (C).

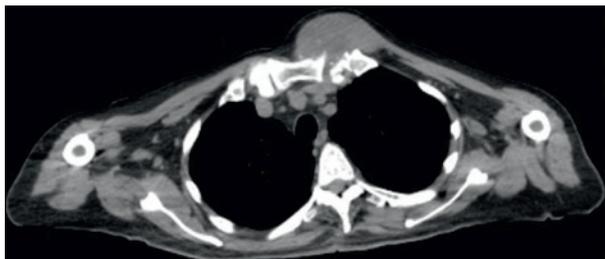
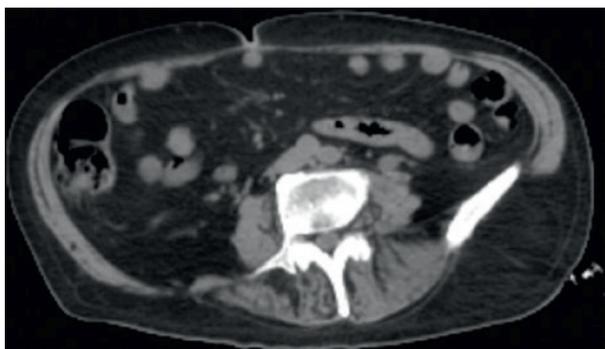


Fig. 3. MRI of the left gluteal mass.



Fig. 4. Biopsy of the primary TCC in bladder, H&E, 20X.

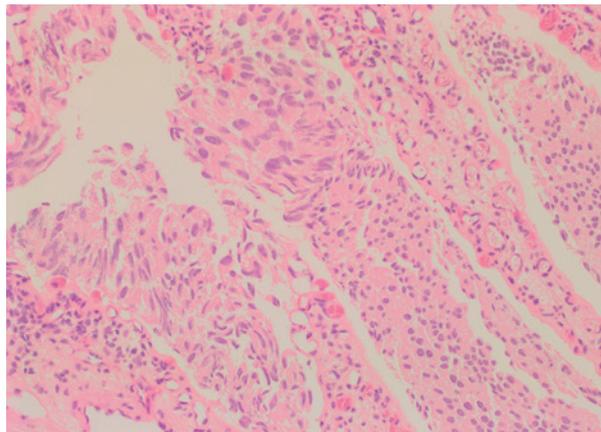
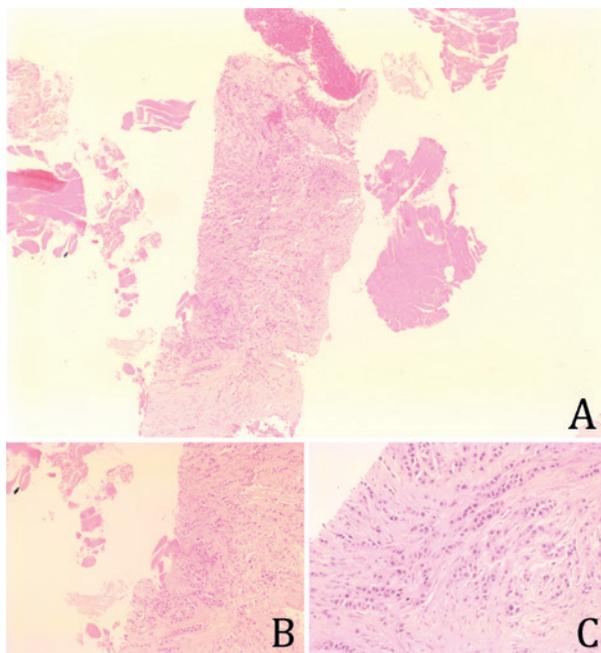


Fig. 5. Biopsy of the gluteal mass: scanning magnification in H&E, 4X, (A), muscle invasion by TCC, H&E, 10X (B), details of the invasive TCC, H&E, 20X, (C).



A needle US guided biopsy was performed under local anaesthesia with a 17G guide needle and a 18G tru-cut needle. The core biopsies obtained showed fibrous and skeletal muscle tissue infiltrated by medium to large sized atypical cells featuring hyperchromatic nuclei, pleomorphism and some atypical mitoses. The cells were arranged in single cords and small nests. Focal necrosis and lymphovascular invasion were also part of the picture. The appearances were consistent with metastasis from the previous high grade transitional cell carcinoma, which was confirmed by immunohistochemistry (Figs. 4-5, Tab. I).

**Tab. I.** Immunohistochemistry Markers for metastatic TCC.

Antibody	Result
CK7	+++
CK20	-
GATA-3	+++

Immunohistochemical markers for CK7 and GATA-3 revealed a strong and diffuse positivity in the infiltrating cells, while CK20 was negative (Fig. 6). These features supported the hypothesis of the urothelial origin.

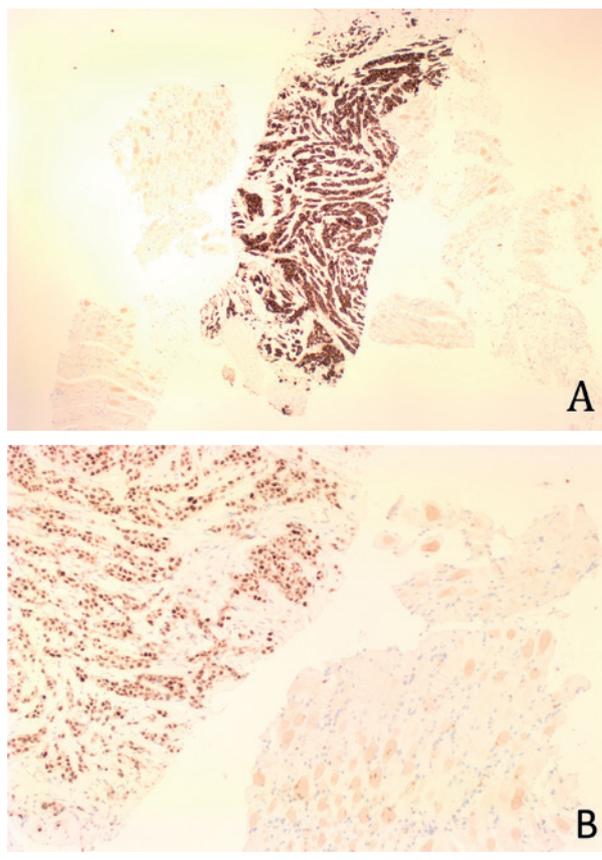
The patient underwent to palliative care only and was discharged. He died about 1 month later.

## Discussion and review of the literature

Bladder cancer is the 4<sup>th</sup> most common tumour in men and the 8<sup>th</sup> in women<sup>1,2</sup>. Transitional cell carcinoma accounts for more than 90% of bladder cancers followed by squamous cell carcinoma and adenocarcinoma<sup>3,4</sup>. Bladder tumours usually have local aggressivity and invasion, and the lymphatic spread involves the pelvic lymph nodes. The hematogenous invasion is less common<sup>4</sup>. Lymph nodes, bone, liver and lung are the most common sites involved in metastatic bladder carcinomas, followed by brain and pleura<sup>1,2</sup>. Despite skeletal muscle representing approximately 50% of the body mass and receiving a large supply of blood, muscle metastases are quite rare in the clinical practice<sup>1,5</sup>. The mechanisms that protect muscle from tumour invasion are still not well known. Many different factors have been implied to explain the resistance that muscles offer to metastases, such as motion and mechanical tumour destruction, muscle's ability to metabolize the tumour-produced lactic acid that favours tumour angiogenesis in other tissues, fluctuations of the local oxygen levels<sup>1,2,5</sup>. Muscle metastases have been reported from lung, pancreas, GI system and ovaries, but only few cases from bladder<sup>1-4,6-8</sup>. As in the case hereby reported, muscle metastases are often associated to multiple lesions in lungs, bones, liver and soft tissue. They usually shows up in the set of an advanced systemic disease and have a worse prognostic significance if compared to metastases in other sites<sup>3</sup>. The role of clinical and imaging data is essential in the diagnosis of metastatic transitional cell carcinoma. The most common clinical presentation is represented by pain and lumps and the images show them as low-density destructive lesions<sup>1,2</sup>.

There is not a single elective immunohistochemistry marker to confirm the urothelial differentiation in a muscle metastasis. A panel of specific and sensible markers such as CK7, CK20, p63, GATA-3, CK5/6 is usually adequate in order to identify the lineage of differentiation and the involved histotype<sup>1</sup>.

In our case the patient complained hip and lower limbs pain and reduction of mobility, and the images revealed multiple lesions in the bones and soft tissue of pelvis. Muscle metastases are often painful because of the lo-

**Fig. 6.** Muscle biopsy. Strong positivity of tumour cells for CK7, 4X (A) and for GATA-3, 10X (B).

cal destructive effects of the tumour and the damage to nerve fibers<sup>3</sup>. The treatment for muscle metastases is often hampered by the advanced stage and bad general conditions<sup>1,3</sup>. In case of non manageable pain the elective therapy is represented by excision followed by chemotherapy and radiotherapy, but the outcome is in general negative and the treatment is essentially performed as palliative method to relief the pain. The prognosis of skeletal muscle metastases is poor because they are usually indicative of advanced systemic disease. The average survival rates in cancer patients with muscle metastases is 4-6 months<sup>1-4</sup>.

Skeletal muscle metastases from bladder malignancies are by fact rarely encountered and, by our knowledges, only few cases are documented in literature<sup>1-4,5-8</sup>, as detailed in the Table II.

The case that we report in this paper can be considered of interest because the review of the available data in literature enlightened that there is only 1 other case of gluteal metastasis from bladder malignancy<sup>2</sup>. Aggressive bladder tumours, like high grade TCCs and adenocarcinomas, have a high tendency to local and systemic spread. Literature reports a relatively small number of muscle metastases from general malignancies<sup>5,9</sup> and only 11 from bladder primary tumours. Muscle metastases from bladder carcinomas have been found in men only

**Tab. II.** Skeletal muscle metastases from bladder cancers.

Case (Author/ Year)	Histotype/Site	Metastases in other sites	Site of muscle metastasis	Age/Sex	Survival rate after detection of metastasis
Katafigiotis et al, 2014	High grade TCC	No	Sartorius	51, M	Alive and well 7 months after excision
Nagao et al, 2004	Poorly differentiated adenocarcinoma	Yes	Gluteus	63, M	Unknown
Doo et al, 2012	High grade TCC	Yes	Sartorius	45, M	Unknown
Koca et al, 2014	High grade TCC	No	Adductor longus	62, M	3 months
Nath et al, 2016	Adenocarcinoma	Yes	Abdominal wall muscle	71, M	4 months
Ekici et al, 1999	TCC	Unknown	Deltoid	41, M	Unknown
Nabi et al, 2003 (retrospective review)	Urinary Bladder	Unknown	Psoas	52 (average), M	Mean 8 months (range 6-12)
Nabi et al, 2003 (retrospective review)	Urinary Bladder	Unknown	Psoas	52 (average), M	Mean 8 months (range 6-12)
Nabi et al, 2003 (retrospective review)	Urinary Bladder	Unknown	Psoas	52 (average), M	Mean 8 months (range 6-12)
Nabi et al, 2003 (retrospective review)	Urinary Bladder	Unknown	Adductor	52 (average), M	Mean 8 months (range 6-12)
Nabi et al, 2003 (retrospective review)	Urinary Bladder	Unknown	Rectus abdominis	52 (average), M	Mean 8 months (range 6-12)
Present case	High grade TCC	Yes	Gluteus	66, M	1 month

ranging from 41 to 71 years (mean age 56 years). The histotypes reported in literature are high grade TCCs and poorly differentiated adenocarcinomas. In most cases the primary lesion has already involved the pelvis and distant sites such as lungs, bone, liver. The muscles most commonly involved are large muscles of the abdominal wall, limbs and pelvis. According to our review there is only 1 other documented metastasis in the gluteal muscle reported by Nagao et al in 2004 as metastasis from a poorly differentiated adenocarcinoma<sup>2</sup>, therefore the case that we report can be considered the first gluteal metastasis from a bladder high grade transitional cell carcinoma.

The outcome for these patients is generally poor. There is only 1 patient reported as alive and well 7 months after metastasis excision<sup>1</sup>, for 3 of them the outcome is not reported<sup>2,3,7</sup> and the remaining 7 patients deceased after an average period of 4 months.

Muscle metastases from bladder cancers can be therefore be considered rare and usually part of an advanced, aggressive systemic disease together with widespread local and metastatic lesions. Their impact on general patient's status and survival rates is negative because they cause pain, loss of function and mobility and are associated to exitus in a short time.

## References

- <sup>1</sup> Katafigiotis I, Athanasiou A, Levis KL, et al. *Metastasis to sartorius muscle from a muscle invasive bladder cancer*. Case Rep Med 2014;2014:524757.
- <sup>2</sup> Nagao E, Nishie A, Yoshimitsu K, et al. *Gluteal muscular and sciatic nerve metastases in advanced urinary bladder carcinoma: case report*. Abdom Imaging 2004;29:619-22.
- <sup>3</sup> Doo SW, Kim WB, Kim BK, et al. *Skeletal muscle metastases from urothelial cell carcinoma*. Korean J Urol 2012;53:63-6.
- <sup>4</sup> Koca I, Ucar M, Bozdog Z, et al. *Adductor longus muscle metastasis of transitional cell carcinoma of the urinary bladder*. BMJ Case Rep 2014 doi:10.1136/bcr-2014-203768.
- <sup>5</sup> Mulsow FW. *Metastatic carcinoma of skeletal muscles*. Archives of Pathology 1943;35:112-4.
- <sup>6</sup> Nath V, Baliga M. *Urinary bladder adenocarcinoma metastatic to the abdominal wall: report of a case with cytohistologic correlation*. Case Rep Pathol 2016;2016:8608412.
- <sup>7</sup> Eckici S, Ozen H, Gedikoglu G, et al. *Skeletal muscle metastasis from carcinoma of the bladder*. Scand J Urol Nephrol 1999;33:336-7.
- <sup>8</sup> Nabi G, Gupta NP, Gandhi D. *Skeletal muscle metastasis from transitional cell carcinoma of the urinary bladder: clinicoradiological features*. Clin Radiol 2003;58:883-5.
- <sup>9</sup> Jemal A, Siegel R, Ward E, et al. *Cancer statistics*. CA Cancer J Clin 2006;56:106-30.