




CASE REPORT

REVISED Case Report: An extremely rare occurrence of recurrent inguinal low-grade fibromyxoid sarcoma involving the scrotum [version 2; peer review: 2 approved]

Samy Chitayat¹, Rodrigo Barros ¹, José Genilson Ribeiro¹, Heleno Augusto Moreira Silva¹, Flávio Rondinelli Sá¹, Bruno de Souza Bianch Reis², Angelo Maurilio Fosse Junior¹

¹Urology, Fluminense Federal University, Niterói, Rio de Janeiro, 24220900, Brazil

²Pathology, Fluminense Federal University, Niterói, Rio de Janeiro, 26299000, Brazil

v2 First published: 29 Jul 2020, 9:789
<https://doi.org/10.12688/f1000research.24287.1>
 Latest published: 22 Oct 2020, 9:789
<https://doi.org/10.12688/f1000research.24287.2>

Abstract





Low-grade fibromyxoid sarcoma (LGFMS) is a rare sarcoma subtype. The most common tumor locations are the deep soft tissue of extremities or trunks. We report a rare case of recurrent LGFMS in the inguinal region involving the scrotum and both testicles. A 38-year-old male patient reported a history of multiple nodular lesions in the left inguinal region accompanied by local inflammation. The patient was submitted for local resection of the lesion at our institution, with histopathological diagnosis of LGFMS. He missed his follow-up, returning with a large bulge in the left inguinal region involving the scrotum with signs of tissue necrosis and local purulent discharge. Surgical exploration was performed and the patient underwent tumor resection in the left inguinal region and the entire scrotum, with bilateral orchiectomy, with the margins enlarged to the right inguinal region and proximal surface of the penis. Local reconstruction was performed with a left fascia lata tensor muscle flap and ipsilateral thigh coverage using partial skin graft. On microscopic examination, the tumor showed spindle cells arranged in bundles, with abundant collagen and myxoid stroma with interspersed prominent vessels. The immunohistochemical study carried out showed immunoreactivity with Ki67 (<5%), immunonegativity with desmin and S100, confirming the diagnosis of LGFMS. Postoperative recovery was good and no recurrence was seen after two years. The patient is in good health, realizing multidisciplinary outpatient follow-up and performing continuous testosterone replacement. Surgical resection with negative margins for localized disease remains the standard treatment for LGFMS.

Keywords


Low-grade fibromyxoid sarcoma, sarcoma, scrotum sarcoma

Open Peer Review

Reviewer Status  

	Invited Reviewers	
	1	2
version 2		
(revision)		
22 Oct 2020		report
		
version 1		
29 Jul 2020	report	report

1. **Felipe Lott**, Instituto Nacional de Câncer (INCA), Rio de Janeiro, Brazil

2. **Nasir Ud Din** , Aga Khan University Hospital, Karachi, Pakistan

Any reports and responses or comments on the article can be found at the end of the article.

Corresponding author: Rodrigo Barros (rodrigo_brrs@yahoo.com.br)

Author roles: **Chitayat S:** Data Curation, Methodology, Writing – Original Draft Preparation; **Barros R:** Conceptualization, Data Curation, Methodology, Writing – Original Draft Preparation, Writing – Review & Editing; **Ribeiro JG:** Data Curation, Writing – Review & Editing; **Silva HAM:** Data Curation, Writing – Review & Editing; **Sá FR:** Methodology, Writing – Review & Editing; **Reis BdSB:** Data Curation, Writing – Review & Editing; **Fosse Junior AM:** Conceptualization, Data Curation, Formal Analysis, Methodology, Resources, Writing – Original Draft Preparation, Writing – Review & Editing

Competing interests: No competing interests were disclosed.

Grant information: The author(s) declared that no grants were involved in supporting this work.

Copyright: © 2020 Chitayat S *et al.* This is an open access article distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

How to cite this article: Chitayat S, Barros R, Ribeiro JG *et al.* **Case Report: An extremely rare occurrence of recurrent inguinal low-grade fibromyxoid sarcoma involving the scrotum [version 2; peer review: 2 approved]** F1000Research 2020, 9:789 <https://doi.org/10.12688/f1000research.24287.2>

First published: 29 Jul 2020, 9:789 <https://doi.org/10.12688/f1000research.24287.1>

REVISED Amendments from Version 1

These revisions have been made in response to peer review. Paratesticular LGFMS are rare with few cases published in the literature. The recurrent tumor was bigger than primary tumor, measuring 13 cm in the largest diameter. Unlu *et al.*, reported two cases of paratesticular LGFMS treated with simple orchiectomy. The patients had residual mass but did not accept additional treatment and both died of the disease, emphasizing the importance of radical surgical treatments. The immunohistochemistry can exclude entities in differential diagnosis and the diagnostic marker for LGFMS is MUC4. However, this marker not available in the lab to perform on this case. The main differential diagnoses are Fibromatosis, Fibrosarcoma, Myxofibrosarcoma, Myxoid neurofibroma, Nodular fasciitis, Myxoid dermatofibrosarcoma, Malignant peripheral nerve sheath tumor.

Any further responses from the reviewers can be found at the end of the article

Introduction

Low-grade fibromyxoid sarcoma (LGFMS) is a rare sarcoma subtype, first described by Evans in 1987¹. The most common tumor locations are the deep soft tissue of extremities or trunks². Paratesticular LGFMS are rare with few cases published in the literature^{3,4}. The etiology still unknown and the incidence is 0.18 per million, representing 0.6% of all soft tissue sarcomas⁵.

Microscopy reveals bland spindle cell tumors with angulated nuclei, scant cytoplasm arranged in a whorled pattern with cells that are frequently immunoreactive to mucin 4². Despite its deceptively indolent clinical behavior and benign histological appearance, LGFMS has a high tendency for local recurrence and late distant metastasis⁶. The current treatment includes surgical excision with clear margins for localized disease with or without radiotherapy, while conventional systemic therapy has limited efficacy in advanced LGFMS⁷.

Here, we report a rare case of recurrent LGFMS in the inguinal region involving the scrotum and both testicles. To the best of our knowledge, there is no case described with this rare presentation.

Case presentation**Patient information and medical history**

A 38-year-old male patient reported a history of multiple nodular lesions in the left inguinal region accompanied by a local inflammatory process since the age of 13. Since then, he had undergone multiple surgical procedures performed by different health services, with clinical and histopathological diagnosis of complicated hidradenitis. The patient was submitted to local resection of the lesion at our institution, with histopathological diagnosis of LGFMS. He missed his follow-up in 2009, only returning in 2017 with a large bulge in the left inguinal region, bigger than primary tumor, involving the scrotum with signs of tissue necrosis and local purulent discharge (Figure 1).

Diagnosis and intervention

Magnetic resonance imaging (MRI) showed a mass of lobulated contours and partially defined limits, measuring 13 cm

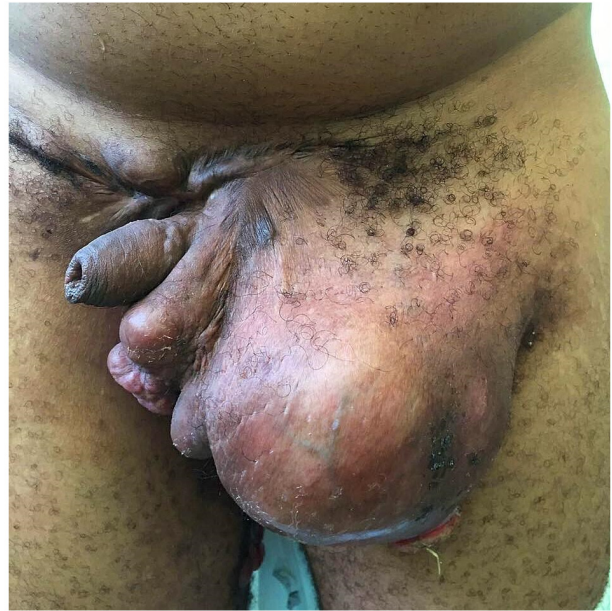


Figure 1. Recurrent inguinal low grade fibromyxoid sarcoma involving scrotum in a 38-year-old patient.

in the largest diameter, located in the left scrotum and extending to the perineal region and the medial aspect of the thigh, with invasion of the ipsilateral adductor muscles, not separable from the left testicle (Figure 2A and 2B).

Given this case of a large recurrent LGFMS, the patient was scheduled for surgical intervention. Under general anesthesia, the patient was placed in supine position and the intraoperative findings were compatible with the MRI results, additionally revealing the involvement of the right testicle. The patient underwent tumor resection in the left inguinal region and the entire scrotum, with bilateral orchiectomy, with the margins enlarged to the right inguinal region and proximal surface of the penis, this stage of the surgery being performed by the urology team (Figure 3). Local reconstruction was performed by the plastic surgery team, with a left fascia lata tensor muscle flap and ipsilateral thigh coverage using partial skin graft (Figure 4).

On microscopic examination, the tumor showed an admixture of hypocellular zone and more cellular, spindle cell nodule. Arcades of small vessels with perivascular sclerosis were seen (Figure 5). The immunohistochemical study carried out showed immunoreactivity with Ki67 (<5%), immunonegativity with desmin and S100, confirming the diagnosis of grade 2 LGFMS according to American College of Pathology staging.

Follow-up

Postoperative recovery was good and no recurrence was seen after two years. The patient is in good health, realizing multidisciplinary outpatient follow-up at least every six months in the departments of oncology, urology, plastic surgery and endocrinology, where interviews, physical examination, image

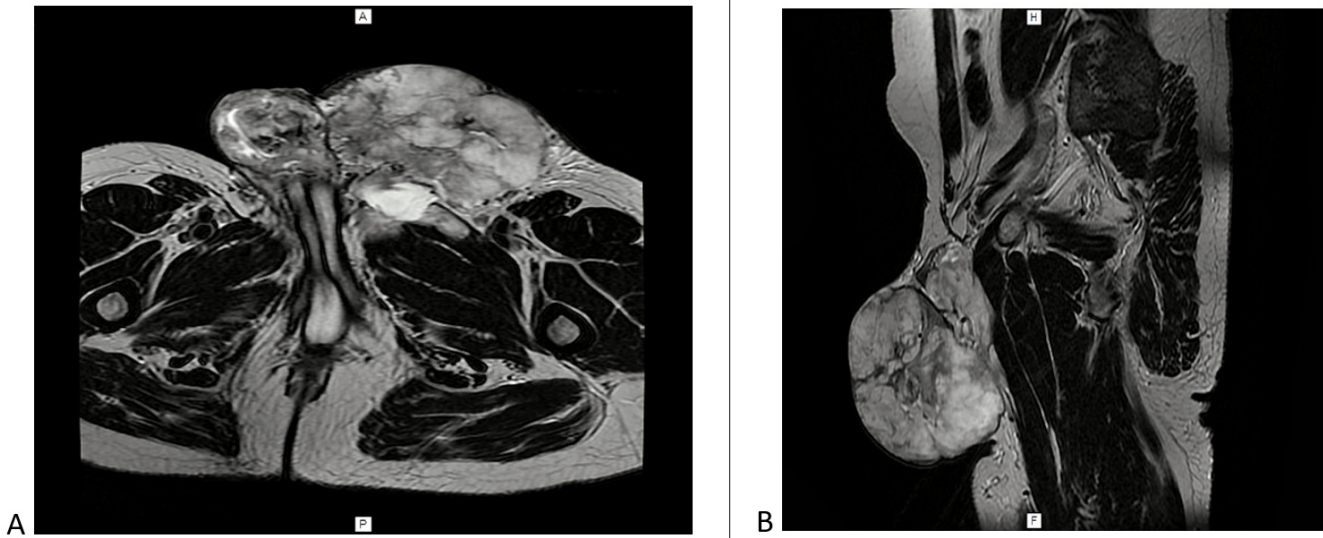


Figure 2. Magnetic resonance imaging. A) Cross section revealing inseparable inguinal mass with structures of the scrotum. B) Sagittal section showing the relationship between the tumor mass and the adductor musculature of the left thigh.



Figure 3. Aspect after resection of inguinal low grade fibromyxoid sarcoma involving the scrotum.

exams and testosterone replacement therapy control are carried out. MRI of the abdomen and pelvis, in addition to chest CT are performed every six months. Testosterone replacement is being performed continuously with intramuscular injections of 1,000 mg of testosterone undecanoate once every 12 weeks, keeping testosterone levels in the reference range without side effects.



Figure 4. Aspect after reconstruction.

Discussion

LGFMS is a recently recognized soft tissue tumor that was first reported in 1987 by Evans as a metastasizing tumor with a deceptively benign histological appearance, affecting predominantly adults during the fourth decade of life¹. Patients are often misdiagnosed with fibromatosis, neurofibroma or other benign conditions instead of LGFMS⁸. In our case, the patient underwent multiple procedures without success due to misdiagnosis of hidradenitis. LGFMS generally occurs in the lower proximal extremities and trunk, but is also infrequently described as arising from the inguinal region and the chest wall⁹. Despite its relatively low-grade histology, local postsurgical recurrence and metastases to lungs and bone are frequently seen and can appear

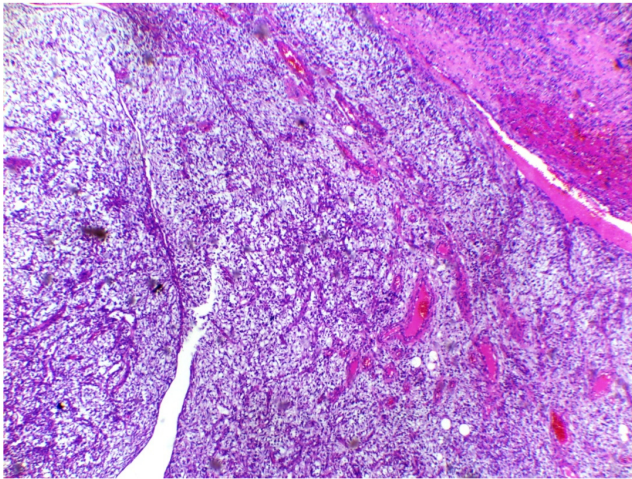


Figure 5. Histological image of the low grade fibromyxoid sarcoma showing an admixture of collagenized and hypocellular myxoid zones with arcades of small vessels.

several years after primary surgery¹⁰. We present a case in which a primary tumor of the inguinal region relapsed after multiple surgical treatments and aggressively invaded adjacent structures, including both testicles.

Radiological examination has an important role in the diagnosis of LGFMS. However, it is difficult to distinguish LGFMS from other mesenchymal tumors due to the rarity. CT scan and MRI can identify the lesions and help evaluate relationships with adjacent structures. In imageological examination, LGFMS is generally seen as a solitary and well circumscribed lesion, although it can be present as multiple infiltrating masses upon recurrence¹¹. MRI techniques can be more helpful than CT to detect the fibrous and myxoid components of the tumor according to the T1/T2 signal intensity¹². In our case, MRI was essential for surgical programming, presenting findings similar to those during surgery.

The definite diagnosis depends on histopathological examination. Histologically, the tumor has a deceptively benign appearance, making diagnosis a challenge. The immunohistochemistry can exclude entities in differential diagnosis and the diagnostic marker for LGFMS is MUC4. However, this marker not available in the lab to perform on this case. The main differential diagnoses are Fibromatosis, Fibrosarcoma, Myxofibrosarcoma,

Myxoid neurofibroma, Nodular fasciitis, Myxoid dermatofibrosarcoma, Malignant peripheral nerve sheath tumor. Therefore, it is essential for the diagnosis to be confirmed by an expert soft-tissue pathologist¹³. The patient in our study had undergone multiple surgical resections without success, due to mistaken histopathological diagnosis of hidradenitis, before being examined at our institution.

Surgical resection with negative margins for localized disease remains the standard treatment for LGFMS. However, treatments for advanced disease are limited. Radiotherapy has questionable efficacy, being reserved for cases of positive margins, recurrence or metastasis. Chemotherapy is usually reserved for patients with metastatic disease. However, there are no data to support the use of any systemic or locoregional treatments⁵. Chamberlain *et al.* recently described their experience with non-surgical therapies to treat LGFMS. According to the authors, systemic therapy has limited efficacy in advanced LGFMS⁷. Unlu *et al.*, reported two cases of paratesticular LGFMS treated with simple orchiectomy. The patients had residual mass but did not accept additional treatment and both died of the disease, emphasizing the importance of radical surgical treatments⁴. Despite tumor recurrence in our case, the patient did not present metastasis after aggressive surgical treatment and it was not necessary to perform adjuvant treatment.

To the best of our knowledge, there is no case described with recurrent LGFMS in the inguinal region involving the scrotum and both testicles. The patient was properly treated through tumor resection and local reconstruction. However, this study has limitations due to the short follow-up period.

Conclusion

LGFMS is a rare sarcoma subtype but one which should be considered in nodular lesions in the inguinal region. Histologically, the tumor has a deceptively benign appearance, making diagnosis a challenge. If missed, adjacent structures such as the scrotum can be aggressively involved. Surgical resection with negative margins for localized disease remains the standard treatment.

Data availability

All data underlying the results are available as part of the article and no additional source data are required.

Consent

Written informed consent for publication of their clinical details and clinical images was obtained from the patient.

References

1. Evans HL: **Low-grade fibromyxoid sarcoma. A report of two metastasizing neoplasms having a deceptively benign appearance.** *Am J Clin Pathol.* 1987; **88**(5): 615–9. [PubMed Abstract](#) | [Publisher Full Text](#)
2. Mohamed M, Fisher C, Thway K: **Low-grade fibromyxoid sarcoma: Clinical, morphologic and genetic features.** *Ann Diagn Pathol.* 2017; **28**: 60–67. [PubMed Abstract](#) | [Publisher Full Text](#)
3. Hansen T, Katenkamp K, Brodhun M: **Low-grade fibrosarcoma--report on**

- 39 not otherwise specified cases and comparison with defined low-grade fibrosarcoma types.** *Histopathology*. 2006; **49**(2): 152-160.
[PubMed Abstract](#) | [Publisher Full Text](#)
4. Unlü Y, Huq GE, Ozyalvaçlı G: **Paratesticular sarcomas: A report of seven cases.** *Oncol Lett*. 2015; **9**(1): 308-312.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
 5. Maretty-Nielsen K, Baerentzen S, Keller J, et al.: **Low-Grade Fibromyxoid Sarcoma: Incidence, Treatment Strategy of Metastases, and Clinical Significance of the FUS Gene.** *Sarcoma*. 2013; **2013**: 256280.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
 6. Kurisaki-Arakawa A, Suehara Y, Arakawa A, et al.: **Deeply located low-grade fibromyxoid sarcoma with FUS-CREB3L2 gene fusion in a 5-year-old boy with review of literature.** *Diagn Pathol*. 2014; **9**: 163.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
 7. Chamberlain F, Engelmann B, Al-Muderis O, et al.: **Low-grade Fibromyxoid Sarcoma: Treatment Outcomes and Efficacy of Chemotherapy.** *In Vivo*. 2020; **34**(1): 239-245.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
 8. Domanski HA, Mertens F, Panagopoulos I, et al.: **Low-grade fibromyxoid sarcoma is difficult to diagnose by fine needle aspiration cytology: a cytomorphological study of eight cases.** *Cytopathology*. 2009; **20**(5): 304-14.
[PubMed Abstract](#) | [Publisher Full Text](#)
 9. Cowan ML, Thompson LD, Leon ME, et al.: **Low-grade fibromyxoid sarcoma of the head and neck: A clinicopathologic series and review of the literature.** *Head Neck Pathol*. 2016; **10**(2): 161-6.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
 10. Evans HL: **Low-grade fibromyxoid sarcoma. A report of 12 cases.** *Am J Surg Pathol*. 1993; **17**(6): 595-600.
[PubMed Abstract](#) | [Publisher Full Text](#)
 11. Hwang S, Kelliher E, Hameed M: **Imaging features of low-grade fibromyxoid sarcoma (Evans tumor).** *Skelet Radiol*. 2012; **41**(10): 1263-72.
[PubMed Abstract](#) | [Publisher Full Text](#)
 12. Yue Y, Liu Y, Song L, et al.: **MRI findings of low-grade fibromyxoid sarcoma: a case report and literature review.** *BMC Musculoskelet Disord*. 2018; **19**(1): 65.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
 13. Folpe AL: **Low-grade fibromyxoid sarcoma: A review and update.** *Pathol Case Rev*. 2002; **7**(4): 139-45.
[Publisher Full Text](#)

Open Peer Review

Current Peer Review Status:  

Version 2

Reviewer Report 29 October 2020

<https://doi.org/10.5256/f1000research.30315.r73563>

© 2020 Ud Din N. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



Nasir Ud Din 

Department of Pathology and Laboratory Medicine, Aga Khan University Hospital, Karachi, Pakistan

Queries have been addressed. Recommend for indexing.

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: I am a histopathologist with expertise in soft tissue and bone sarcomas.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 1

Reviewer Report 12 October 2020

<https://doi.org/10.5256/f1000research.26796.r72099>

© 2020 Ud Din N. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



Nasir Ud Din 

Department of Pathology and Laboratory Medicine, Aga Khan University Hospital, Karachi, Pakistan

- The authors have reported a case of recurrent scrotal LFMS. The initial and recurrent tumor size needs to be reported. Was recurrent tumor bigger than primary tumor?

- The authors claim their case to be first case in this location. However, a previous publication (Unlü *et al.*, 2015¹) has reported two paratesticular LGFMS. Please read that article and cite.
- Apart from morphology, the diagnostic marker for LGFMS is MUC4. Was this marker not available in the lab to perform on this case?
- In the pathology section, a differential diagnoses should be first described followed by mentioning appropriate IHC.

References

1. Unlü Y, Huq GE, Ozyalvaçlı G, Zengin M, et al.: Paratesticular sarcomas: A report of seven cases. *Oncol Lett.* 2015; **9** (1): 308-312 [PubMed Abstract](#) | [Publisher Full Text](#)

Is the background of the case's history and progression described in sufficient detail?

Partly

Are enough details provided of any physical examination and diagnostic tests, treatment given and outcomes?

Yes

Is sufficient discussion included of the importance of the findings and their relevance to future understanding of disease processes, diagnosis or treatment?

Yes

Is the case presented with sufficient detail to be useful for other practitioners?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: I am a histopathologist with expertise in soft tissue and bone sarcomas.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Reviewer Report 19 August 2020

<https://doi.org/10.5256/f1000research.26796.r68357>

© 2020 Lott F. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The author(s) is/are employees of the US Government and therefore domestic copyright protection in USA does not apply to this work. The work may be protected under the copyright laws of other jurisdictions when used in those jurisdictions.

**Felipe Lott**

Department of Urology, Instituto Nacional de Câncer (INCA), Rio de Janeiro, Brazil

The case is well described, with good quality photos and image exam. A well documented pathology analysis was made. It is a rare pathology and this article brings more substance for future diagnosis alert. The treatment is correctly described and clear. All case history is acceptable. I think there is a reason for the article to be indexed without necessity for revision.

Is the background of the case's history and progression described in sufficient detail?

Yes

Are enough details provided of any physical examination and diagnostic tests, treatment given and outcomes?

Yes

Is sufficient discussion included of the importance of the findings and their relevance to future understanding of disease processes, diagnosis or treatment?

Yes

Is the case presented with sufficient detail to be useful for other practitioners?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: I am an expert in urology oncology at Brazilain National Cancer Institute.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

The benefits of publishing with F1000Research:

- Your article is published within days, with no editorial bias
- You can publish traditional articles, null/negative results, case reports, data notes and more
- The peer review process is transparent and collaborative
- Your article is indexed in PubMed after passing peer review
- Dedicated customer support at every stage

For pre-submission enquiries, contact research@f1000.com

F1000Research