Simultaneous radical orchiectomy and primary RPLND in a case of cancer developed on a secondary intra-abdominal testis

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Abstract

Introduction and objectives: Testicular cancer represents approximately 1-1.5% of all forms of male cancer and 5% of urogenital neoplasia. The relative risk of developing testicular cancer on an intraabdominal testis is 2.75 – 8 times higher.
The aim of this paper is to present the therapeutic strategy in a rare case of a testicular tumor developed on a secondary intraabdominally located testis after a surgical intervention.

Materials and methods: A 38 year old patient was diagnosed, during the investigations for male infertility, with absence of the left testicle and an abdominal tumor. The anamnesis described a hypermobile left testicle, that became stuck in the abdomen after an intervention for left inguinal hernia which had been performed two years prior. Blood tests including the tumor markers were within the normal ranges. A chest, abdomen and pelvis contrast enhanced CT scan revealed a left pelvic tumor of about 15 cm (the abdominal malignant testis), and microadenopathy on the left side of the aorta. A hockey stick incision with left pararectal extension was performed, and the left tumor testicle was identified. After the left orchiectomy the frozen section biopsy revealed a pure seminoma. Considering the incidence rate of retroperitoneal micro metastases in stage I high risk seminomas of up to 32%, and taking into account the length of the incision needed to excise the main tumor, we decided to perform a primary left RPLND. The dissection limits were represented superior by the left renal vein, lateral by the ureter, medial by interaortocaval space above the origin of the inferior mesenteric artery, below this level the limit being set by the common iliac artery, in order to preserve the hypogastric plexus of the anterior side of the aortic bifurcation, with an important role in ejaculation.

Results: No immediate or late postoperative complications were registered. The histopathological exam confirmed the diagnosis of a large classical testicular seminoma, with a maximum diameter of 15 cm, that invaded the albuginea, epididymis and fat tissues from the proximal part of spermatic cord (pT3). The analysis of fat and lymphatic tissues from lateroaortic space showed sinusal histiocytosis in a group of 11 lymph nodes (N0). The tumor markers remained negative throughout the follow-up period, and no adjuvant therapy was necessary. At the 1 year mark, a toraco-abdomino-pelvic CT scan showed no signs of local relapse or secondary metastases.

Conclusions: This rare case confirms the high incidence of testicular cancer developed on an intraabdominal testis, not only undescended but also secondary after a surgical intervention for an inguinal hernia. Although the standard treatment for testicular high risk seminoma consists of orchiectomy and chemotherapy, in selected cases a primary RPLND can provide an efficient therapeutic alternative.

Key words: testicular cancer, cryptorchidism, primary RPLND

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**Introduction and objectives**

Testicular cancer represents approximately 1 – 1.5% of all the cancers in male patients, and 5% of urogenital neoplasms. 3-10 new cases in 100 000 men are diagnosed per year in developed countries, the highest incidence being found in scandinavian countries.

In 95% of cases, testicular cancer is represented by germ cells tumors (GCTs). The rest of them are tumors of the spermatic cord, of the testicular appendices and lymphoid tumors. (1,3) Germ cell tumors are localized in over 90% of the time at a testicular level, while 2 to 5% of them are found in other organs, the most frequent being the retroperitoneum and the mediastinum. (1)

Testicular neoplasia has its highest incidence between the ages of 20 and 40, and after leukemia it is the second most frequent cancer encountered in 15-19 year old boys. Yet three peaks of development have been established for the testicular cancer: infancy till the ages of 4 or 5 (given by the teratomas and yolk sac tumors), 30 years of age (determined by the high incidence of seminomas and nonseminomas) and 60 years of age (caused by the spermatocytic seminomas). (1,8,9)

Testicular cancer can be bilateral in 1 – 2% of cases at the moment of diagnosis. Patients that present unilateral testicular cancer and the contralateral testicle is normal, may be diagnosed with intratubular germ cell neoplasia in 5 to 9% of the situations, but if the other testicle is cryptorchid or atrophic this rate can go all the way up to 36%. (1,9)

The most important risk factors for developing testicular cancer are cryptorchidism, family and personal history of testicular cancer and intratubular neoplasia. (1,2,6,7) Patients with male infertility have also a high risk of developing testicular cancer, and although fertility isn’t usually the reason why they seek medical care, 52% of testicular cancer cases have oligospermia and 10% azoospermia. (1,4,8)

The relative risk that an intraabdominal testis (primary – cryptorchid, or secondary after a surgical intervention) leads to cancer is 2.75 – 8 times higher. Two theories have been proposed to explain the association between cryptorchidism and testicular cancer. The first theory consists of the fact that the testicle is exposed to a 2 degree higher temperature than in the scrotum. The second one argues a hormonal imbalance that can produce both cryptorchidia and tumor developement. There is also a difference considering testicular tumor incidence, between inguinal and abdominal cryptorchidia, the latter being four time higher. (8,9)

The aim of this paper is to present the therapeutic strategy in case of a testicular tumor developed on an intraabdominally located testis secondary to a surgical intervention.

**Materials and methods**

A 38 year old patient was diagnosed, during the investigations for male infertility, with an abdominal tumor.

The anamnesis described a hypermobile left testicle, that became stuck in the abdomen after an intervention for left inguinal hernia which had been performed two years prior, by general surgeons in an Asian country, where the patient had been detached for work. At admission the patient showed no testicle in the left scrotum, and had a palpable tumor mass in the left iliac fossa, while the blood tests including the tumor markers were within the normal ranges.

An ultrasound of the scrotum confirmed the absence of the left testis, and a normal right testicle. A thoraco-abdomino-pelvic contrast enhanced CT scan revealed a left pelvic tumor of about 15 cm (the abdominal malignant testis), and micro adenopathy on the left side of the aorta (Img 1).

A hockey stick incision with left pararectal extension was performed (Img 2), and the left tumor testicle was identified (Img 3). After the left orchiectomy the frozen section biopsy revealed a pure seminoma.

Considering the incidence rate of retroperitoneal micro metastases in stage I high risk seminomas of up to 32%, and taking into account the length of the
incision needed to excise the main tumor, we decided to perform a primary left RPLND (Img 4). The excision limits were represented superior by the left renal vein, lateral by the urether, medial by interaortococaval space above the origin of the inferior mesenteric artery, below this level the limit being set by the common iliac artery, in order to preserve the hypogastric plexus of the anterior side of the aortic bifurcation, with an important role in ejaculation (Img 5).

Results

No immediate or late postoperative complications were registered.

The histopathological examination confirmed the diagnosis of a large classical testicular seminoma (Img 6), with a maximum diameter of 15 cm, that invaded the albuginea, epididimis and fat tissues from the proximal part of spermatic cord (pT3). The analysis of fat and lymphatic tissues from lateroaortic space showed sinusal histiocytosis in a group of 11 lymph nodes (N0).

At a microscopic level (Img 7), the tumor showed a lobular pattern, with a fibrous stromal network and lymphocyte inclusions between the cells. The tumor cells exhibit plenty of pale cytoplasm rich in glycogen, and large nuclei with 1-2 nucleoli.

The tumor markers remained negative throughout the follow-up period, and no adjuvant therapy was necessary.

At the 1 year mark, a toraco-abdomino-pelvic CT scan showed no signs of local relapse or secondary metastases (Img 8).

Discussions

Testicular cancer is a curable disease due to early diagnosis, multimodal treatment based on surgery, efficient chemotherapy, radiotherapy and a thorough follow-up. Advanced surgical treatment of the testicular cancer associated with newly developed chemotherapy provide survival rates of 80 – 90 %, compared to 5 – 10 % registered before the introduction of Cisplatin. (1)

Another important detail is guiding the patients with advanced tumors in need of wide surgery for retroperitoneal adenopathies to a specialized center.

Patients with cryptorchidism have a high risk of developing testicular cancer (2.75 to 8 times higher), that decreases (to 2-3 times) if orchydopexia is done before puberty. (1,4) The risk of developing testicular cancer on the contralateral testicle normally situated in the scrotum is only slightly increased. (2,4)

Considering the case history of increased mobility of the left testicle and the surgery for left inguinal hernia, when the left testicle remained immovable in the abdomen, the question raised is whether the increased mobility was indeed a risk factor and if the tumor was not already present at the moment of the first surgery.

Tumors developed on cryptorchidic testicles are represented in 74% of the cases by seminomas, while tumors developed on the testicle that undergone orchydopexia are represented in 63% of the cases by TGNS. (4) This fact is of a clinical importance regarding prognostic, especially in late diagnosed tumors.

Stage I testicular seminoma is categorized in low or high risk for occurrence of occult metastasis depending on the size of the tumor (over 4 cm) and rete testis invasion. (1,3,15) For patients with high risk stage I testicular seminomas, the rate of retroperitoneal micro metastases is 32%. (3,16)

Tumors developed on an abdominal testicle are difficult to assess clinically and are asymptomatic for a long period of time, leading to a late diagnosis.

The treatment recommended by the European guidelines of urology in high risk testicular seminomas is represented by orchiectomy and chemother-

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apy. In this case we choose orchiectomy and RPLND in the same surgical session, postoperative follow-up being simpler and less expensive and the reproductive function less affected.

Germ cell epithelia is very sensitive to chemotherapy and radiotherapy, so in these types of situations patients should be advised regarding sperm conservation, optimally timed before imagistic investigations. In theory all patients will present azoospermia after chemotherapy, and patients with normal sperm count in the moment of diagnosis will reach that level again in 50% and 80% of the cases in 2 and 5 years.

Several issues emerge from this rare case and should be discussed.

The first one is the surgical treatment of a hypermobile or cryptorchid testis associated with an inguinal hernia. And the goals should be orchidopexy and hernia repair, in order to prevent the thermal malignant transformation of the testicle, to avert its torsion or injury against the pelvic bone, and to achieve a good cosmetic result. Depending on the position of the affected testis, the orchidopexy procedure can be performed either through an inguinal approach or a scrotal approach.

If the undescended testicle is palpable inside the scrotum, or is hypermobile and can be pulled inside the sac, the scrotal incision is best suited for the orchidopexy, while the hernia can be closed either at the external inguinal ring or at the internal one, with a secondary inguinal incision.

If the testis is located inside the abdomen, an oblique inguinal incision following Langer’s lines is needed, with a careful dissection of the Scarp’s fascia not to damage the underlining testicle. The remnants of the gubernaculum are incised, and the testis is then mobilized and the hernia sac is isolated and closed at the internal inguinal ring.

The testis is set inside the scrotum, inside a newly created subcutaneous or subdartos pouch, with or without sutures. If the length of the spermatic cord is insufficient, more actions can be taken in order to gain the extra centimeters needed. The most common is the Prentiss maneuver, which consists of opening the transversalis fascia and moving the testis behind the inferior epigastric artery and vein, into a more median position. Further the internal oblique muscle fibers can be divided and the internal inguinal ring can be widened, while the lateral spermatic fascia can be additionally dissected inside the retroperitoneum.

If orchidopexy is not possible due to technical reasons, or is not recommended for reasons of atrophy or malignant transformation, the testicle should be removed.

So in cases of inguinal hernias associated with an absence of the testis from the scrotum, the surgeon should investigate and clarify the position of this organ prior to the operation, and solve both problems during the same intervention. Because performing orchidopexy or orchiectomy is more important than repairing the hernia.

Our case demonstrates that ignoring these facts, usually by general surgeons, can lead to a severe outcome due to the neoplastic evolution of an abnormally located testicle (inguinal or intra-abdominal). According to our research, this is a very rare condition, only a few cases being reported in the literature.

In conclusion, general surgeons that frequently deal with inguinal hernia repair must be warned about this condition and refer the cases with hypermobile or undescended testicles to the urologist, because the treatment and prevention of testicular neoplasia is more important.

The second issue is the therapeutic approach of a stage I testicular cancer (a seminoma in our case) developed on an intra-abdominal testis. According to the guidelines, the standard treatment of a high risk stage I seminoma (larger than 4 cm, with rete testis invasion) is radical orchiectomy and chemotherapy, primary RPLND being reserved for patients that don’t consent to chemo or radiotherapy. The particularity of our case – a large abdominal tumor that required a long incision – allowed for a primary RPLND without significantly prolonging the incision or increasing the morbidity.

As main benefits, primary RPLND ensures an accurate staging and can provide a curative approach for patients with minimal retroperitoneal disease, while avoiding normal complications associated with chemo and radiotherapy. In our case the lymph nodes proved negative for malignancy, during the 1.5 year follow-up failing to discover any signs of local or distant relapse of the cancer.

Conclusions
This case confirms the high incidence of testicular cancer developed on an intra-abdominal testis, either cryptorchidic or secondary to a surgical intervention for an inguinal hernia. General surgeons must be aware of this possibility, assess the state of the ipsilateral testicle, and refer the patient to an urologist if the organ...
is not in its normal scrotal position, as an undescended testis is a more important condition than a hernia. Although the standard treatment for testicular high risk seminoma consists of orchiectomy and chemotherapy, in selected situations a primary RPLND can provide an efficient therapeutic alternative.

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