Case Report

Radiological clues for diagnosing intra-abdominal seminoma in undescended testis on computed tomography✩

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ABSTRACT
We report a case of intra-abdominal seminoma in an undescended testis, focusing on the radiological clues for diagnosis on computed tomography. A 49-year-old man visited our hospital with a palpable abdominal mass and underwent abdominopelvic computed tomography. Computed tomography demonstrated an ovoid, mildly enhanced, well-defined mass measuring 21 × 16 × 9 cm in the small bowel mesentery mimicking a mass of mesenteric origin. However, a vascular structure was observed in the left posterior aspect of the mass. The vascular structure originated from the inferior posterior part of the mass and ran cranially. The artery subsequently united to the aorta, and the vein united to the left renal vein. We identified the artery and vein as the testicular artery and vein, respectively. We also noted the absence of a left spermatic cord in the left inguinal canal. Therefore, we concluded that the mass originated from the left undescended testis. The patient underwent surgery, and the mass was removed with the testicular vessels; the resected testicular vein was mostly filled with thrombus. On pathological examination, the mass was confirmed to be a seminoma in the undescended testis.

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Introduction

Huge intra-abdominal seminomas arising from undescended testis are uncommon; therefore, radiologists are not familiar with its computed tomography (CT) findings. It is often mistaken for mesenteric or retroperitoneal sarcoma in clinical practice, especially when radiologists are not aware of the presence of an undescended testis in the patient. However, upon identifying radiological clues, such as the drainage of the mass into the testicular vein and the absence of a spermatic cord in the inguinal canal on CT, the diagnosis of intra-abdominal seminoma in the undescended testis can be made easily.

✩ Competing Interests: The authors declare that they have no competing interests.
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A 49-year-old man presented to our hospital with occasional dyspnea and dizziness. The patient had lost 5 kg within 2 years. The patient looked pale and had not previously undergone any surgery. The patient reported that he had left cryptorchidism. On physical examination, a huge, hard, non-tender mass was palpable in the entire abdomen. Laboratory study revealed decreased hemoglobin (9.3 g/dL) and other non-specific results. The patient underwent abdominopelvic CT. Enhanced axial CT revealed an ovoid, well-defined, mildly enhanced mass measuring $21 \times 16 \times 9$ cm in the small bowel mesentery. The mass extended from the level of the lower pole of the kidney to the dome of the urinary bladder. The mass was surrounded by mesenteric fat and compressed the adjacent bowel loop mimicking a mass of mesenteric origin. However, a vascular structure was observed anterior to the left psoas muscle at the left posterior aspect of the mass. The artery was well enhanced by the contrast material, but the vein was not (Fig. 1A, arrow). Enhanced coronal CT scan showed that the vascular structure originated from the inferior posterior aspect of the mass (Fig. 1C, arrow) and ran cranially (Fig. 1D, arrow). The vein was partially enhanced just before flowing into
the left renal vein (Fig. 1D, arrowhead). Oblique sagittal maximal intensity projection and coronal volume rendering reconstruction images showed that the artery united to the aorta (Figs. 2A and B, arrow) and the vein united to the left renal vein (Figs. 2A, star and B, arrowhead). We noted that this was consistent with the testicular artery and vein. We also noted the absence of a left spermatic cord in the left inguinal canal (Fig. 1B, arrow). Based on these findings, we concluded that the mass originated from the left undescended testis. The patient underwent surgery, and the mass was removed with the testicular vessels (Fig. 3, arrow). The resected testicular vein was mostly filled with thrombus. On pathological examination, the mass was confirmed to be a seminoma in the undescended testis.

**Discussion**

Undescended testes are present in approximately 6% of full-term neonates and 0.8% of infants at 1 year of age [1]. Bilateral undescended testes occur in 10% of the patients. Undescended testes are located anywhere along the testicular descent pathway, from the lower pole of the kidney to the external inguinal ring. Approximately 10% of undescended testes are located intra-abdominally.

Undescended testes are predisposed to malignancy, infertility, and torsion. Undescended testis is present in 3.5%-14.5% of patients with testicular tumors, and the tumor incidence is higher in the intra-abdominal testis [1,2]. The most common tumor is the seminoma.

Radiologists are not familiar with the CT findings of intra-abdominal seminoma arising from the undescended testis owing to its relatively rare occurrence. Based on the reported CT findings, they are nonspecific, presenting as mildly enhanced mass along the expected course of testicular descent; however, some reports have described a “testicular vascular pedicle” sign [3,4]. The testicular vascular pedicle indicates the arrangement of the testicular vessels exiting and entering the testicle [4]. Thus, the demonstration of a testicular vein draining into the left renal vein or inferior vena cava originating from an abdominal mass can aid in the diagnosis of the mass originating from intra-abdominal undescended testis.

When radiologists are not aware of the presence of an undescended testis in the patient, intra-abdominal seminoma arising in the undescended testis is often mistaken for mesenteric or retroperitoneal sarcoma, especially for large masses. In these cases, the vascular structure that supplies and drains blood flow to the mass, rather than the characteristics of the

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**Figure 2** – Oblique sagittal maximal intensity projection and coronal volume rendering reconstruction image show that the artery is united to the aorta (A, B, arrow) and the vein is united to the left renal vein (A, star; B, arrowhead).

**Figure 3** – A well encapsulated huge mass with vascular pedicle (arrow) was observed during surgery.
mass itself, might be used to make the diagnosis. Similarly, we were able to make an accurate diagnosis prior to operation by demonstration that the vascular structure originating from the mass was a testicular vessel.

In our case, the testicular vein was enlarged and was mostly unenhanced; however, it was only partially enhanced just before flowing into the left renal vein. We predicted that it was filled with the thrombus, which was confirmed at surgery. In cases of testicular carcinoma, thrombosis in the inferior vena cava, renal vein, or testicular vein can be observed owing to the low-flow state resulting from tumor compression or direct tumor invasion [3,5].

Scrotal tests are important for the diagnosis of intra-abdominal seminoma in undescended testes. If the patient does not mention the presence of an undescended testis, the scrotal test is easily omitted during physical examination. In fact, a previous study emphasized on the importance of conducting scrotal test in men with an abdominal mass to rule out intra-abdominal seminoma [6].

Radiological findings on CT focusing on the drainage vessel of the mass, no mass itself, and scrotal test are important for the diagnosis of intra-abdominal seminoma in the undescended testis.

## Conclusion

Two radiological clues for the diagnosis of intra-abdominal seminoma in the undescended testis on CT are the absence of an ipsilateral spermatic cord in the inguinal canal and identification of a mass draining into the testicular vein.

### Patient consent

Consent obtained.

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