

## Teaching Case Studies

### Tc-99m sulfur colloid SPECT-CT in diagnosis of Splenogonadal Fusion

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The Word count : 1070 words

## **Abstract**

The type of accessory spleens that associate with the gonad called Splenogonadal fusion (SGF). A 3 years old boy was referring to King Saud Medical City by his parent with a left scrotal swelling that was noticed since one year before presentation. Tc99m-SC is a superior tool when it comes to the sensitivity and specificity. The nature of Tc99m-SC is targeting three organs liver/spleen/bone marrow.

In other words, the only organs Tc99m-SC can be visualized these three organs. Furthermore, if there are any tissues anywhere such as; accessory spleens can be identified without even biopsy the tissue or orchiectomy. According to this case the patient was done laparoscopy, the masses was removed and orchiectomy was avoided. The histopathological confirmed normal splenic tissue was matching the nuclear medicine report.

## **Introduction:**

Accessory spleens make an appearance when there is deficient mesenchymal buds during development. It can be arising from the spleen into the gonad descent. The type of accessory spleens that associate with the gonad called Splenogonadal fusion (SGF).<sup>[1]</sup>

Splenogonadal fusion also called ectopic scrotal spleen and usually present before the age of 20, is less than age 10 mostly in the males in the left testis only. The ratio between male to female SGF is 16 male Vs one.<sup>[2]</sup> According to the other cases reported about SGF there are just a few of them used nuclear medicine to roll out SGF. In this case, we report a succussed diagnosis of SGF using technetium<sup>99m</sup> sulfur colloid.

## **Case Report:**

A 3 years old boy was referring to King Saud Medical City by his parent with a left scrotal swelling that was noticed since one year before presentation, it appeared with an unusual scrotal swelling, painless and did not change in size. There was no history of trauma. On examination testicular ultrasound, there were both testicles are seen in the scrotum. The right testicle measured 1.8 x 0.7 cm which shows normal echogenicity and vascularity (Fig.1a) The left testicle measured 1.2 x 0.8 cm which showed normal echogenicity and vascularity.

However, there was a well-defined oval-shaped abnormal soft tissue inseparable from the left testis which shows homogeneous, echogenicity with a diameter measurement of 3 x 1.2 cm and adjacent feeding vessel (Fig.2 b). No obvious calcification identified. No evidence of hydrocele or enlarged lymph nodes.

Finally, The imaging differentials include underlying testicular neoplasm and Tc-SC was performed to diagnose SGF.

B

### **Techniques**

The patient was injected in a total of 2.5 (millicurie) mCi of Tc99m-SC. The first image was a static image over the abdominal region anterior and posterior for ten minutes. Right after the static image Single-photon emission computed tomography (SPECT/CT) images were applied; 360° rotation, 128 × 128 matrix, 30 seconds per the frame over the same region.

### **Nuclear Medicine Report:**

The finding; the liver is located in normal anatomic location with these measuring; 11 x 10.5 cm, the tracer uptake is adequate and homogeneously distributed all over the liver. As well as the spleen is visualized within a normal anatomical location measuring about 7 x 5 cm. There was evidence of two abnormal focal areas of uptake (Fig 2.)

The most intense is located in scrotum measuring about 2x2 cm matching with mass noted on the previous ultrasound and is located anterior to the left testicle (Fig 1). The mass is hyperdense compared to the normal testis density. The second focal abnormal uptake is smaller (about 1 cm of diameter) and less active is located in anterior part of the left iliac fossa between the abdominal wall and the urinary bladder highly suggestive of accessory spleen tissue

. Conclusion, study highly impressive of SGF and small accessory spleen in the left iliac fossa and in the left testicle.

After these diagnostic tests, the patient underwent left laparoscopy splenules over left testis and abdominal splenules. There was approached through an inguinal incision. The both specimens were sent for histopathological examination. The diagnosis splenic tissue with no significant pathological change.

## **Discussion**

The type of accessory spleens that associate with the gonad called Splenogonadal fusion (SGF) <sup>[1]</sup>. Splenogonadal fusion also called ectopic scrotal spleen and usually occurred before 20 years of age, is less than age 10 mostly in the males in the left testis only. SGF is an unusual medical disorder that presents from birth. This congenital malformation will appear as splenic tissue in the gonad<sup>[3]</sup>. Historically, SGF was mentioned for the first time by W.A. Sneath the demonstrator of anatomy at the University of Manchester in 1913<sup>[4]</sup>. There are two types of SGF depending on either connected, the spleen and the gonad or unconnected<sup>[3]</sup>. SGF is mostly reported in child age and present with an abnormal mass in the testicular. The first step to diagnoses SGF the patient comes with pain in the left testis with swelling in the left scrotum. The ultrasound (US), Computed tomography (CT), and Magnetic resonance imaging (MRI) will represent this kind of case as abnormal mass.

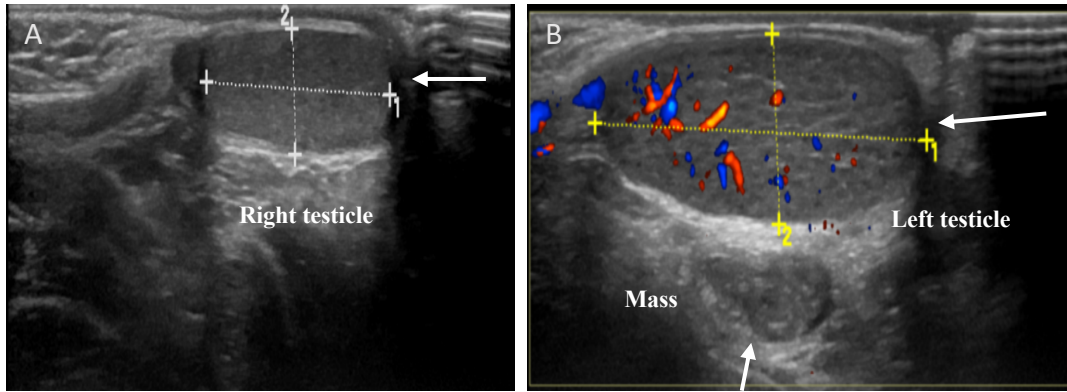
In this case report, USG, MRI and CT scans were performed which revealed the discrete left hemiscrotal soft tissue mass inseparable from left testis. However, these modalities failed to characterised the mass. Tc 99m-SC is a non invasive modality to detect ectopic functioning splenic tissue. In the present case it helped to characterize the scrotal mass and diagnose splenogonadal fusion non invasively (Fig 3.)

Unfortunately, our literature review indicates there are few cases was reported using Tc99m-SC to diagnosis SGF. In this case, the patient was sent to the nuclear medicine department to roll out SGF. The superiority of nuclear medicine to differ between the distinctive tissues depend on the percentage of the radiotracer distribution in the body. The accuracy of Tc99m SC bonding with the reticuloendothelial system cells about 92%. In other words, if Tc99m SC was preparing with the proper way at the hot lab and imaging with the right protocol will concentrate just at three organs liver, spleen, and bone marrow. In this case, visually the high tracer uptake in the liver and spleen (Fig. 1) and the rest of the body has no tracer uptake except the high two abnormal focal areas of uptake which is turned out accessory spleens. Unfortunately, our literature review indicates there are few cases was reported using Tc99m-SC to diagnosis SGF <sup>[5]</sup>.

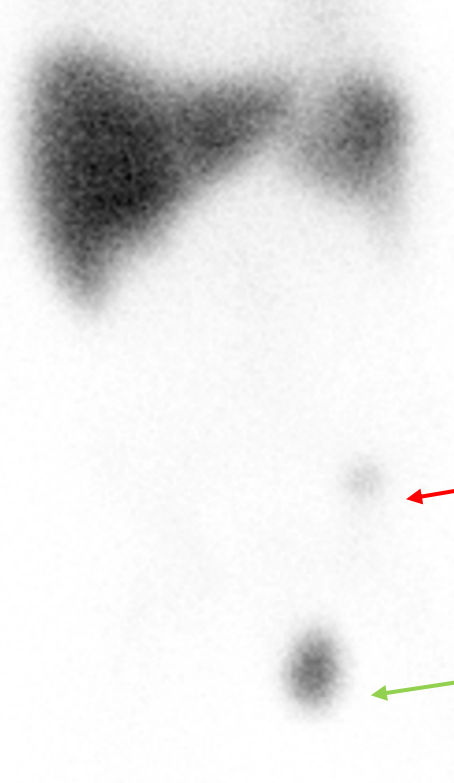
**Conclusion** Tc99m -SC scan helps to diagnose SGF non-invasively and has a potential role in evaluation of testicular masses.

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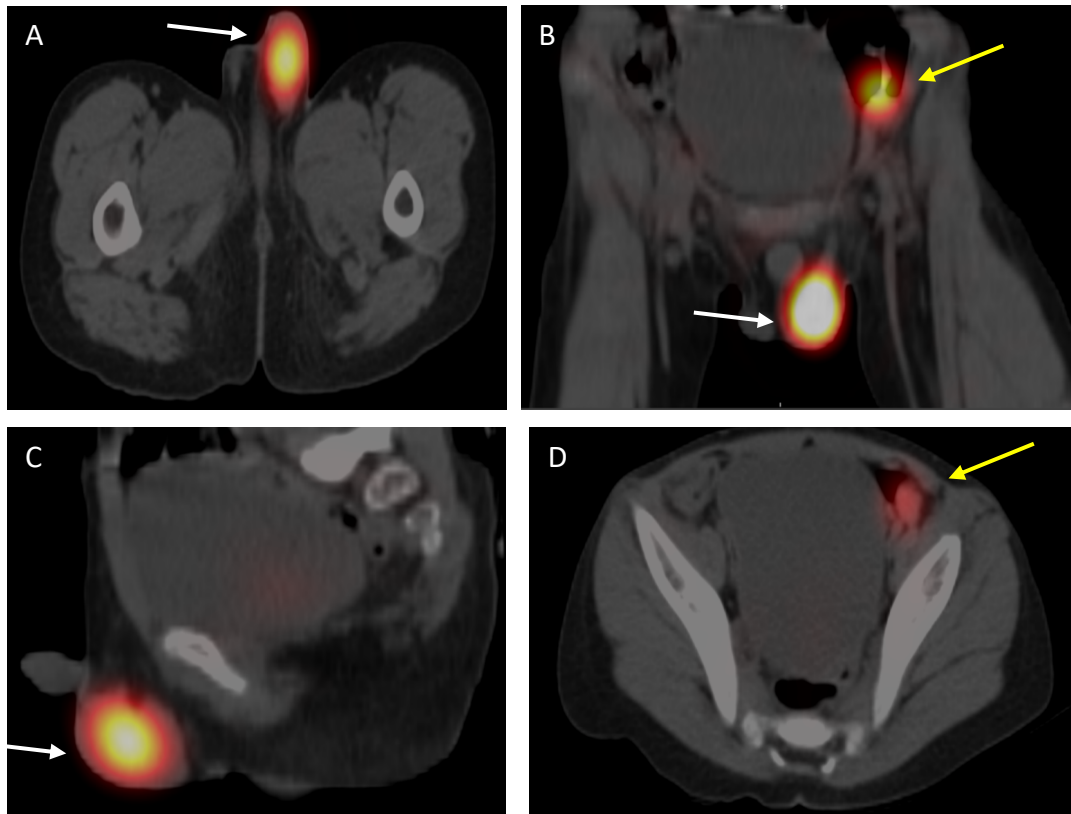


**FIGURE 1.** *A* US of the scrotum. The right testicle measures 1.8 x 0.7cm which shows normal echogenicity and vascularity. US of the scrotum. **B** The left testicle (horizontal arrow) measures 1.2 x 0.8 cm which shows normal echogenicity and vascularity. A well-defined oval-shaped abnormal soft tissue mass (Vertical arrow) inseparable from the left testis which shows homogeneous, echogenicity measuring 3 x 1.2cm and adjacent to feeding.



**FIGURE 2.** <sup>99m</sup>Tc-SC scan. Anterior Planar View of abdomen and pelvis showd normal biodistribution of tracer with two abnormal focal areas of uptake; the most intense is located in scrotum measuring about 2x2cm matching with the mass noted on the previous ultrasound “green arrow”, and another mass is located in anterior part of the left iliac fossa “red arrow”.





**FIGURE 3.** Tc99m SC **A** axial view SPECT/CT view , **B** coronal SPECT/CT view and **C** sagittal SPECT/CT view. Evidence of two abnormal focal areas of uptake “white arrows” **D** axial view SPECT/CT view second focal abnormal uptake is smaller (about 1 cm of diameter) and less active is located in anterior part of the left iliac fossa between the abdominal wall and the urinary bladder highly suggestive of accessory spleen tissue “ yellow arrows”