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● *Case Report*

RETROPERITONEAL GERM CELL NEOPLASM: MR AND CT

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A case of germ cell neoplasm in an undescended retroperitoneal testicle is reported. CT revealed a large mass most consistent with a chronic hematoma. MRI demonstrated findings typical for neoplasm, and this was confirmed on biopsy.

Keywords: **MRI; Undescended testicle; Testis neoplasm.**

INTRODUCTION

A case of germ cell neoplasm in an undescended retroperitoneal testicle is reported, with CT and magnetic resonance (MR) findings. On CT, the mass mimicked a hematoma with its heterogeneous appearance. However, on MR the signal characteristics were not classic for hematoma, but were suspicious for neoplasm.

CASE REPORT

A 49-year-old Caucasian male was admitted complaining of a 2-month history of an enlarging abdominal mass, anorexia, lethargy, and 25-lb weight loss. He had a history of congenital absence of the right kidney and undescended left testicle. In 1972, a tumor of his right (descended) testicle was discovered, and he underwent orchiectomy and retroperitoneal lymph node dissection. The undescended left testicle was not found. Surgery was complicated by injury to the abdominal aorta which required graft placement. The testicular mass was reported to be benign, and he received no adjuvant therapy. He did well until 8 months prior to this admission, when he presented with an abdominal mass. This was determined to be a pseudoaneurysm at the distal junction of the graft and the native aorta, and a successful graft bypass was performed. The patient again did well until his current hospitalization. On physical examination a firm, nonmobile mass was palpated which was predominantly to the left of the umbilicus.

A CT examination of the abdomen (Figs. 1A and 2A) revealed a 10 × 10 cm complex, heterogeneous, low density mass to the left of a calcified pseudoaneurysm. The mass displaced the left kidney laterally and compressed the renal pelvis causing moderate hydronephrosis. Differential diagnosis included retroperitoneal hematoma or neoplasm.

Magnetic resonance (MR) imaging was performed for further tissue characterization and demonstrated a 21 × 14 × 9 cm left-sided retroperitoneal mass with heterogeneous signal intensity which displaced the left renal artery and vein anteriorly and the left kidney laterally (Figs. 1B,C and 2B,C). The mass invaded the left psoas muscle and eroded the left lateral margins of the second and third lumbar vertebral bodies (Fig. 3). As the MR signal was not typical of a chronic abdominal hematoma (concentric ring sign[7]) but was most consistent with tumor, biopsy was recommended.

An ultrasound-guided biopsy revealed anaplastic germ cell tumor, probably embryonal in origin. Pertinent laboratory tests at this time revealed an elevated beta subunit of human chorionic gonadotropin (β-hCG), with a value of 175 U/L. Alpha fetoprotein (AFP) was normal at less than 7.5 IU/mL. The patient has responded to two courses of VP-16 and carboplatin.

DISCUSSION

With an incidence of approximately 5700 new cases per year, testicular cancer is the most common carci-

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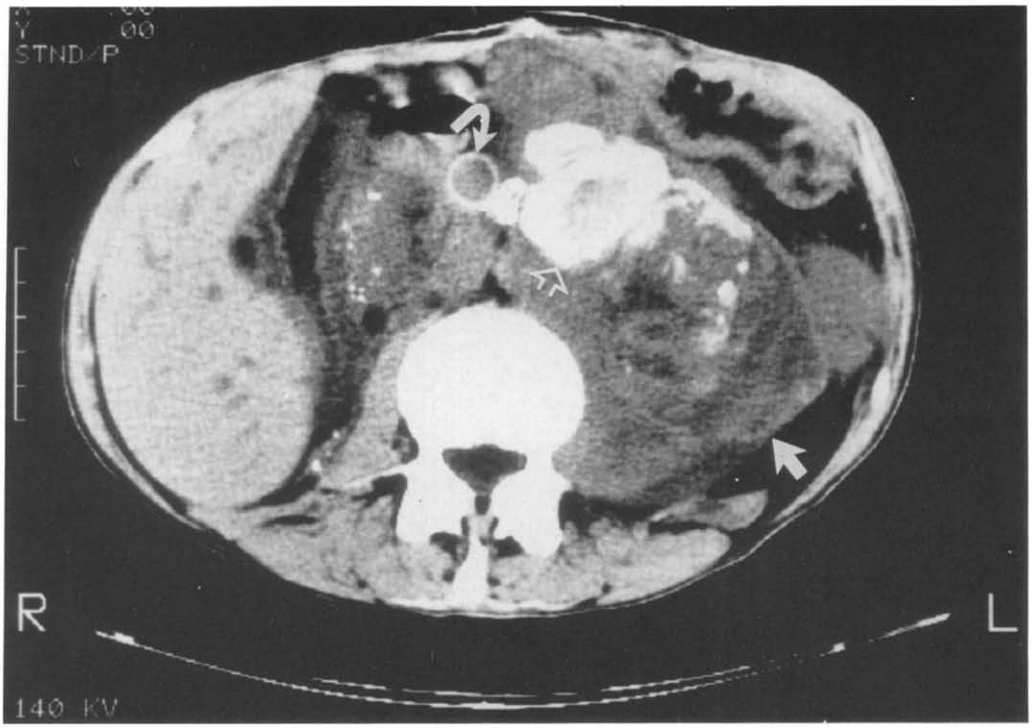
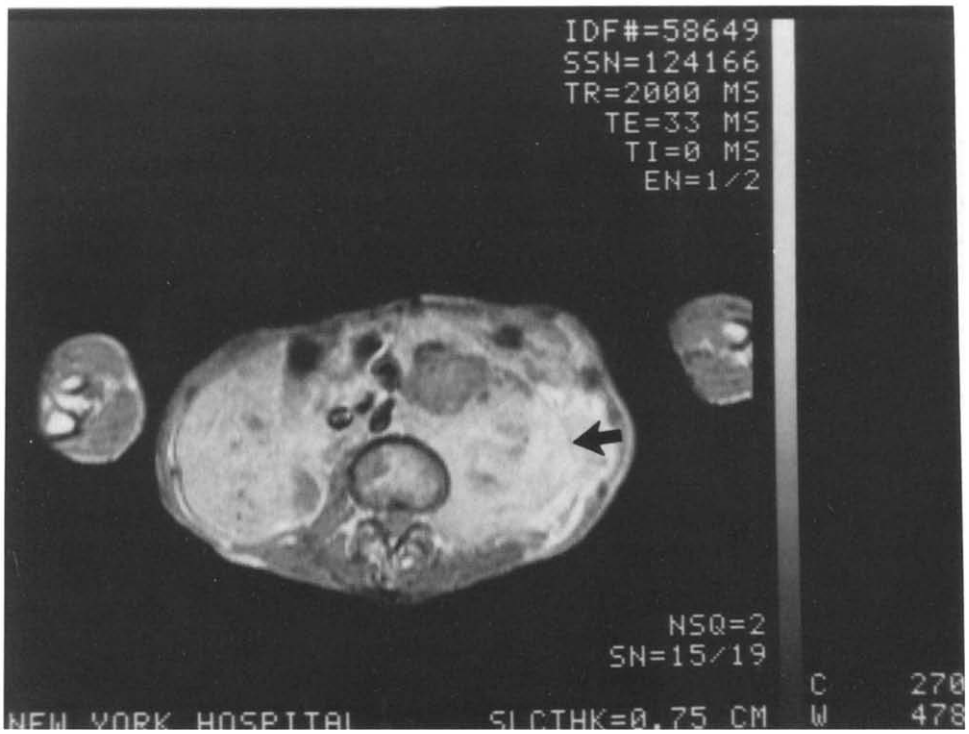
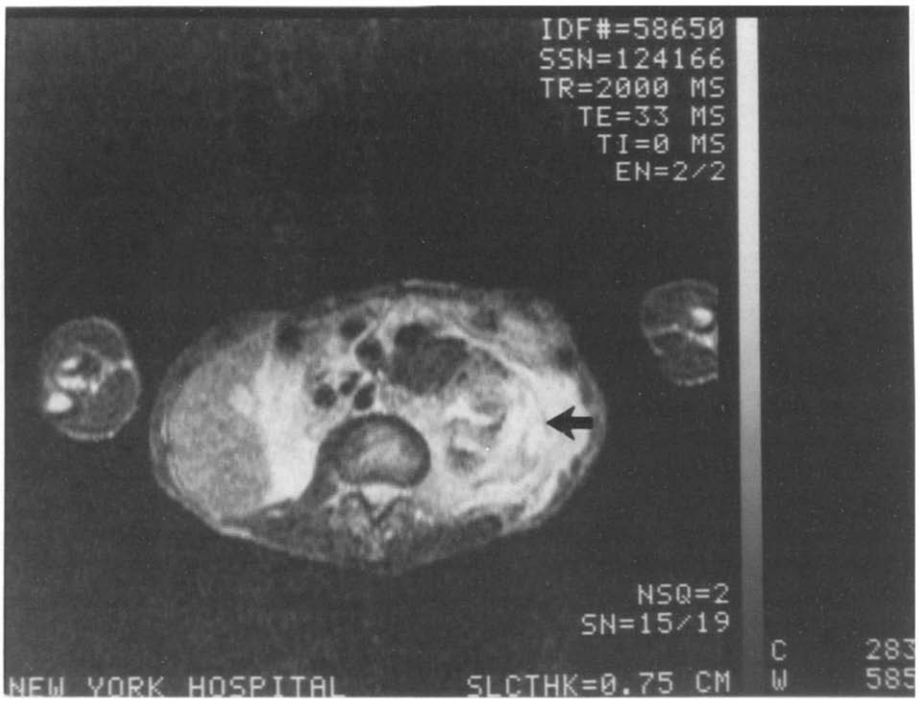


(A)



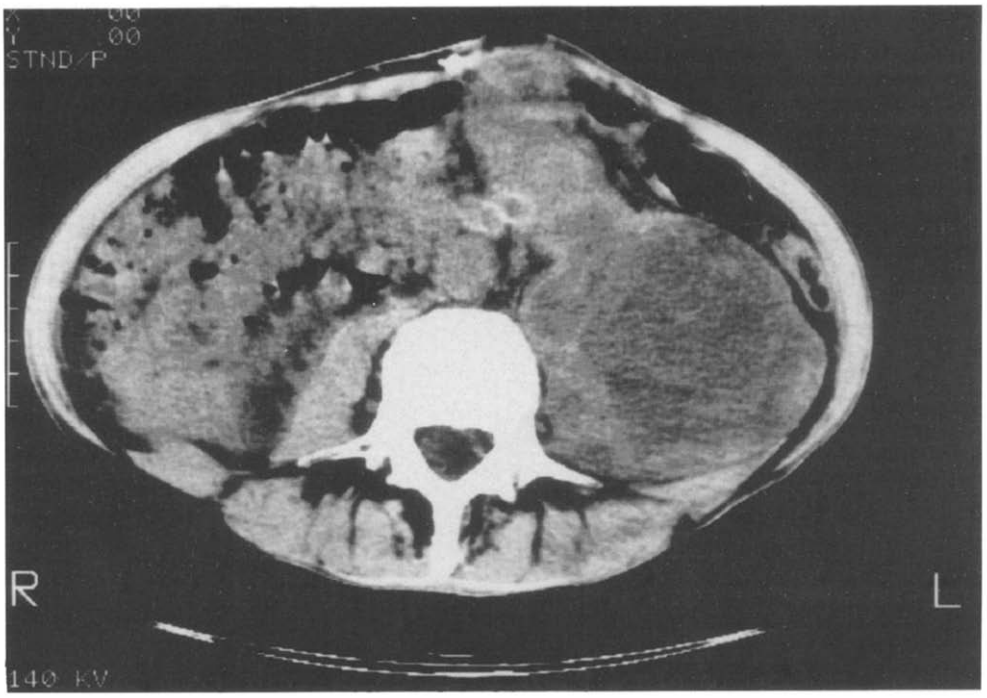
(B)

Fig. 1. Axial CT and MR (.6 T) images demonstrating large left sided heterogeneous retroperitoneal mass. (A) Postcontrast CT reveals the low density mass (arrow) adjacent to the calcified pseudoaneurysm (open arrow) and aortic graft (curved arrow). (B) SE 2000/33 MR image at same level shows the mass (arrow) to be of intermediate signal intensity. (*Figure continued on facing page.*)



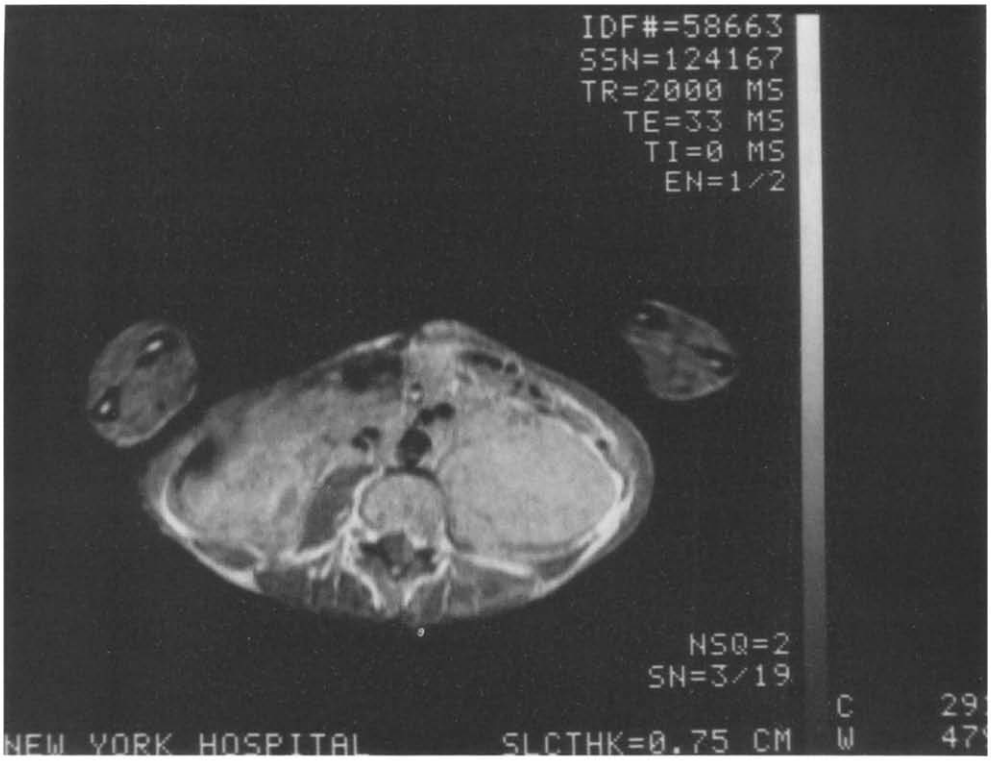
(C)

Fig. 1 continued. (C) SE 2000/85 MR image demonstrates heterogeneous increased signal intensity within the mass (arrow).



(A)

Fig. 2. Axial images at the level of the aortic bifurcation demonstrate the inferior extension of the mass. (A) Postcontrast CT image. (*Figure continued on overleaf.*)



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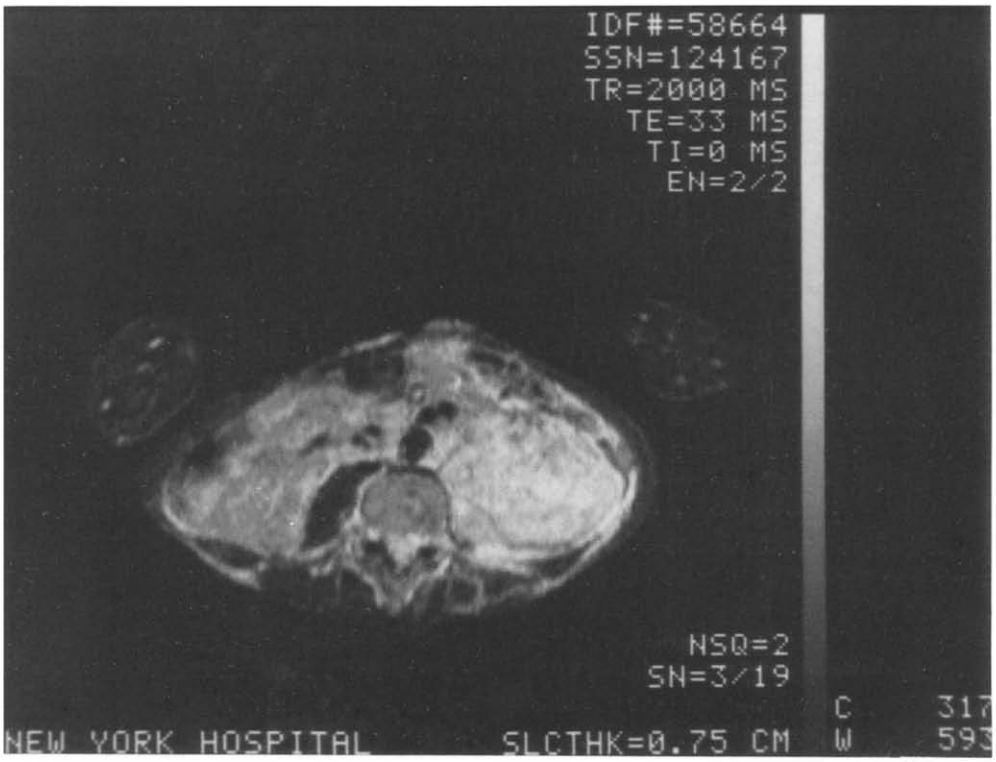

(C)

Fig. 2 continued. (B) SE 2000/33 MR image and (C) SE 2000/85 MR image reveals increase in signal intensity of the mass.

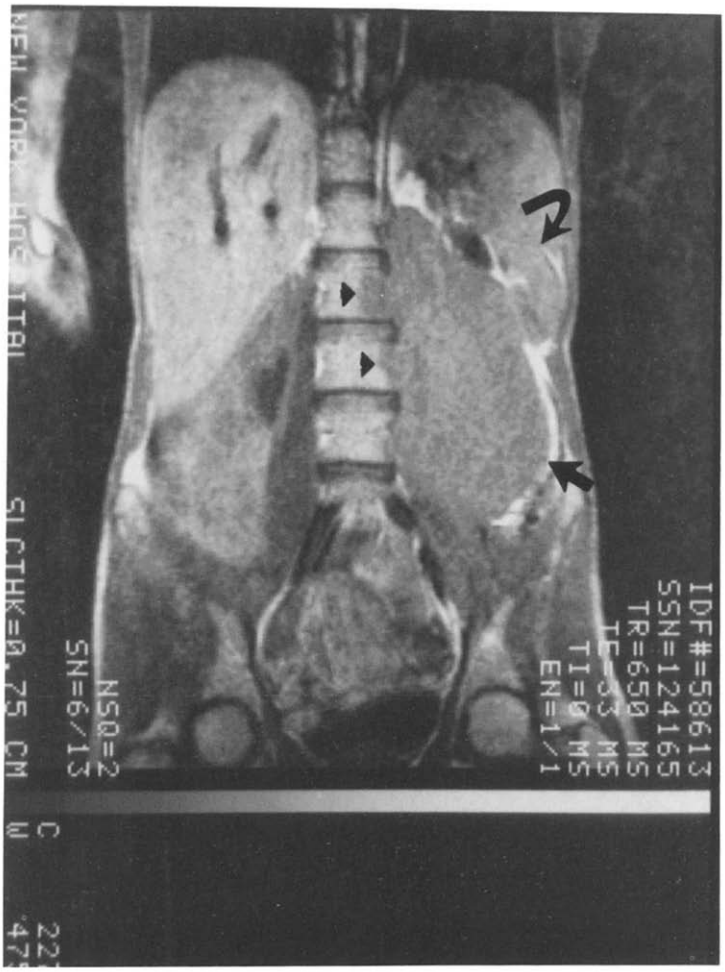

Fig. 3. SE 650/33 coronal MR image demonstrates the large retroperitoneal mass (arrow) with intermediate signal intensity displacing the left kidney superio-laterally (curved arrow), and erosion of the left lateral border of the second and third lumbar vertebral bodies with obliteration of the paraspinal fat (arrowheads).

noma in men between the ages of 15 and 35.[5] There are several predisposing factors, including a history of cryptorchidism, testicular atrophy, testicular cancer in the contralateral testis, and inutero exposure to diethylstilbestrol (DES).[3,13] Men with a history of cryptorchidism have an increased risk of developing testicular cancer, reportedly up to approximately five times normal.[6] This risk applies to the undescended testicle (even after orchiopexy) as well as to the contralateral normally placed testis.[1,2,8,9]

When an undescended testicle is discovered in infancy, orchiopexy at 1 year of age is the preferred treatment. Surgery is not performed earlier because a large number of testes will descend in the first year (either spontaneously or with hormone administration). Deferring the surgery later than 2 years is not recommended due to the increased risk of infertility, as degenerative changes can occur in cryptorchid testes as early as 2 years of age. When cryptorchidism is discovered later in life, up to 32 years of age, orchiectomy is performed due to the increased risk of testicular malignancy. However, with the discovery of an undescended testicle after this age, surgery is not recommended because the risks of anesthesia outweigh the risks of malignancy.[4]

Classification of testicular tumors is based on cell type, with 95% being germ cell and the remainder stromal in origin. Germ cell tumors include seminomas and nonseminomas (i.e., embryonal cell, teratoma, and choriocarcinoma).

Germ cell neoplasms of the testis and ovary may secrete the tumor markers β-hCG and AFP. β-hCG is normally produced only by the syncytiotrophoblastic cells of the placenta; however, these cells are also

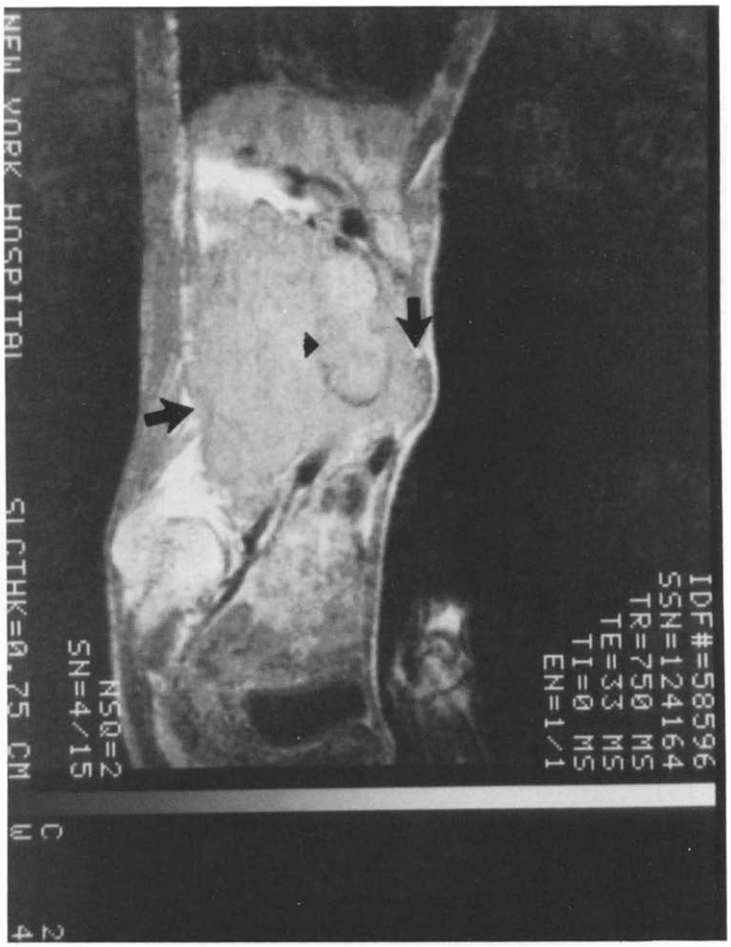

Fig. 4. SE 650/33 sagittal MR image demonstrates the mass extending to the anterior abdominal wall (arrows), and the old pseudoaneurysm with calcified rim (arrowhead).

present in choriocarcinoma, and may be present in a small percentage of embryonal cell carcinoma and seminoma. AFP (a less specific tumor marker) is commonly secreted by embryonal cell carcinoma, endodermal sinus tumors, hepatocellular carcinoma, and gastrointestinal neoplasms, but also has nonmalignant sources such as hepatocellular dysfunction.[5,12] One of the above markers will be elevated in 70–90% of patients with nonseminomatous testicular tumors.[10,11]

The CT and MR images demonstrate the ability of both modalities to assess extent of disease. MR is also able to suggest the mass represents neoplasm rather than hematoma based on signal characteristics. A malignant tumor will show decreased or intermediate signal intensity on the first echo, and should increase in signal intensity on the second echo. Hematoma of a chronic nature usually will have a "concentric ring" appearance, which this case did not exhibit.

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