



Fig 1. Helical computed tomography, arterial phase with HCC between segments III and IV.

tumor seeding, especially in the needle tract after RFA.² Among studies including almost 1000 treated patients, no fatal complication had been reported until May 2003. The first reported death in the literature was due to a colonic perforation by heat diffusion 24 days after RFA for a segment 5-located HCC.³

Recently others authors described RFA-related hemobilia, but without fatal complication.⁴ An increasing proportion of the causes of hemobilia have been of iatrogenic origin caused by therapeutic or diagnostic procedures. Massive hemobilia is a relatively rare but potentially life-threatening cause of upper gastrointestinal hemorrhage. The case described emphasizes that the RFA may cause not only localized tumor destruction or injury of the liver parenchyma and biliary system but also thermally mediated damage of vascular structures. The number of cases is likely to increase as RFA therapy becomes more common.

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References

1. Curley AS, Izzo F, Ellis LM, Nicolas Vauthey J, Vallone P. Radiofrequency ablation of hepatocellular cancer in 110 patients with cirrhosis. *Ann Surg* 2000;232:381-91.
2. Llovet JM, Vilana R, Brú C, Bianchi L, Salmeron JM, Boix L, et al. Increase risk of tumor seeding after percutaneous radiofrequency ablation for single hepatocellular carcinoma. *Hepatology* 2001;33:1124-9.
3. Casaril A, Hilal MA, Ciola M, Invernizzi L, Campagnaro T, Nicoli N. One death after radiofrequency thermal ablation

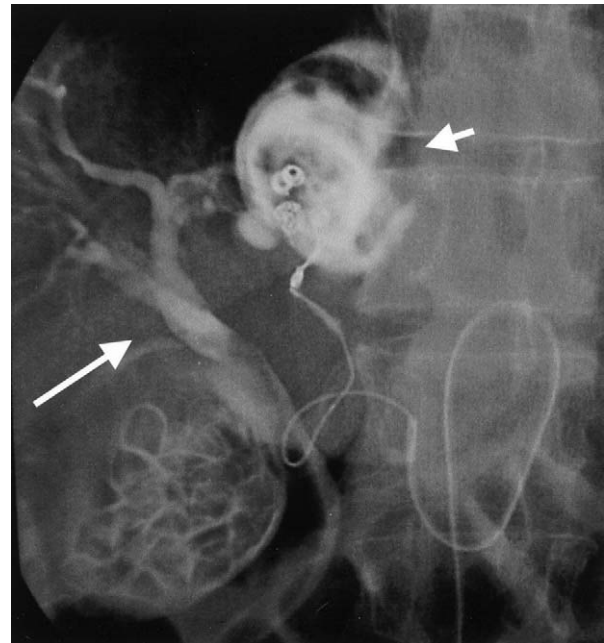


Fig 2. Angiography shows pseudoaneurysm of left hepatic artery (small white arrow) with contrast filling biliary tree (white arrow).

for hepatocellular carcinoma in a cirrhotic patient. *Surgery* 2003;133:598.

4. Yamamoto T, Kubo S, Hirohashi K, Tanaka S, Uenishi T, Ogawa M, et al. Secondary hemocholeyst after radiofrequency ablation therapy for hepatocellular carcinoma. *J Gastroenterol* 2003;38:399-403.

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A case of surgical treatment of acute pulmonary embolism without the use of extracorporeal circulation

To the Editors:

Massive pulmonary embolism (PE) is a life-threatening condition. In bedridden postoperative patients, incidence of lethal PE involves 0.2% to 0.6% of patients.¹ A 44-year-old man with a known PE had a hemorrhagic stroke with intracerebral hematoma and urinary tract hemorrhage caused by anticoagulation. Therefore thrombolysis or operation with extracorporeal circulation being performed on a fully heparinized patient were absolutely contraindicated. During surgery tapes were placed on the tourniquets around the great veins. The 4/0 polypropylene suture stays were placed on the pulmonary trunk. After the great veins were occluded and the blood inflow was stopped, the pulmonary artery was opened longitudinally, the blood was sucked into the Cell-Saver (Cell-Saver BRAT 2, Cobe Cardiovascular Division of Sorin Biomedica, Arvada, Colo), and then

the pulmonary artery branches were probed with use of an ordinary suction aspirator with a higher negative pressure applied. A decrease of blood pressure to 50/20 was tolerated, and the pulmonary artery was closed using a partial clamp and the blood inflow into the heart was restored. This maneuver was repeated 7 times. A 20 × 1 cm thrombus was retrieved from the right pulmonary artery branch and a 5 cm × 7 mm thrombus from the left. In addition, a finger was inserted through the right atrial appendage to search for an atrial septal defect; none was found. The pulmonary artery was again accessed to make sure that no further embolic material from the right side of the heart had been mobilized into the pulmonary artery. On the seventh postoperative day, the patient was transferred to a regional hospital for neurologic rehabilitation. Trendelenberg² first reported pulmonary embolectomy in 1908. In 1965 Vosschulte et al³ first reported in *Surgery* a successful pulmonary embolectomy through a trans-sternal approach by inflow occlusion of the great veins at normothermia. Our patient shows that in some clinical situations, surgical methods regarded as of historical interest only may contribute to saving the patient's life.

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References

1. Bergquist D, Lindblad B. Pulmonary embolism in surgical practice. *Eur J Vasc Surg* 1992;6:453-5.
2. Trendelenburg F. Über die operative behandlung der embolie der lungenarterie. *Arch Klin Chir* 1908;86:686-700.
3. Vosschulte K, Stiller H, Eisenreich F. Emergency embolectomy by the transsternal approach in acute pulmonary embolism. *Surgery* 1965;58:317-23.

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Is thyroid suppression an effective procedure in improving preoperative sestamibi parathyroid scintigraphy

To the Editors:

Royal et al¹ recently published an interesting article in *Surgery* on the potential role of thyroid hormonal suppression in patients with primary hyperparathyroidism (PHPT). In their series of 99 patients with PHPT, the authors reported only a 70% sensitivity of sestamibi scintigraphy by use of planar and tomographic (SPECT) imaging without thyroid suppression, somewhat lower than in other studies reporting a sensitivity of 90% or more with sestamibi SPECT.^{2,3} Their purpose is to improve sensitivity of technetium 99m-sestamibi scintigraphy in localizing parathyroid adenomas so that a higher percentage of patients with PHPT might benefit from minimally invasive parathyroidectomy. The authors hypothesized that the suppression of thyroid metabolism

after thyroid hormone therapy could decrease sestamibi thyroid uptake, thus improving parathyroid adenoma visualization. In their experience thyroid hormone suppression (either with l-thyroxine 100 µg daily for 4 weeks or liothyronine 25 µg 3 times a day for 10 days) allowed a successful sestamibi parathyroid localization in 10 of 14 patients (71% of cases) after an initial nonlocalizing sestamibi scintigraphy.

It should be noted that sestamibi is currently used in the follow-up of patients with differentiated thyroid cancer to early detect recurrent disease without the discontinuation of thyroid hormone therapy. In our experience⁴ normal thyroid remnants were visualized by sestamibi, as well as metastases in patients with thyroid cancer who have undergone total thyroidectomy and thyroid hormone therapy. The difference in the radio-tracer uptake intensity between normal thyroid remnants and metastatic deposits was not significant.⁴ We would therefore assume that the thyroid-stimulating hormone effect would not be expected to have an important influence on sestamibi uptake by thyroid tissue.

A standard dose for planar and SPECT parathyroid scintigraphy is 740 MBq, and the labeling efficiency of sestamibi with ^{99m}Tc-pertechnetate is usually 90% to 95%. It can be calculated that approximately 37 to 74 MBq of the given dose is nonlabeled ^{99m}Tc-pertechnetate, equivalent to the dose of this radiotracer used for thyroid scintigraphy. Avidly trapped by normal thyroid tissue, ^{99m}Tc-pertechnetate washes out very slowly from the normal thyroid tissue in comparison to sestamibi. Thus the relatively high uptake of ^{99m}Tc-pertechnetate by the thyroid might actually interfere with the visualization of a sestamibi-avid parathyroid adenoma, especially one located behind or close to the thyroid contour.³ This effect might be contributed to some of the initially nonlocalizing scintigraphic examinations in Royal's study.

The authors suggested that the improvement in parathyroid visualization they achieved by use of thyroid hormonal suppression was related to a decrease in thyroid sestamibi uptake. We are suggesting that the improvement could be due instead to blocking thyroid uptake by nonlabeled ^{99m}Tc-pertechnetate. If so, the benefit could be more readily achieved by the oral administration of a single 400-mg tablet of potassium perchlorate, a powerful antagonist of ^{99m}Tc-pertechnetate thyroid uptake and retention.³ This simple expedient might avoid the 4-week protocol of thyroid hormone treatment. It seems unlikely, however, that thyroid suppression could greatly improve identification of parathyroid adenomas in patients with concomitant sestamibi-avid thyroid nodules because thyroid hormone will not reduce radiotracer uptake in such nodules.⁴

When a minimally invasive parathyroidectomy is being considered, the most sensitive scintigraphic technique available should be used. Either sestamibi SPECT or double-tracer scintigraphy (with the iodine 123/sestamibi or ^{99m}Tc-pertechnetate/sestamibi technique) has been at least 90% sensitive in localizing solitary