Cardiac transplantation is currently the accepted treatment for end-stage cardiac failure refractory to medical treatment. One year survival is approximately 85% and 10 years survival approaches 60%. Infections and rejection remain significant causes of morbidity and death despite improvements in early antibiotic treatment and immunosuppression techniques. Fungal infections, especially aspergillosis and candidiasis, continue to be a major cause of morbidity and mortality [1]. Computed tomography has emerged as an important tool for early diagnosis of infections, ischemic or neoplastic complications [3-5]. Gallium-67 scintigraphy is used to evaluate fever of unknown origin and to confirm suspected infections. Co-registration and image fusion of the two modalities combines the CT anatomical information with the functional-biological information of scintigraphy.

Patient Description
We present the case of a 47 year old patient, a heart transplant recipient due to dilated cardiomyopathy. The patient was hospitalized 3 months after the operation because of low grade fever, tenderness and redness of the sternal scar. Chest CT and gallium-67 scintigraphy studies were normal at that time. He was treated with intravenous cefazidime and vancomycin. Two months later he was hospitalized again with low grade fever and a secreting wound in the lower sternal scar area. Local bacterial culture from the wound yielded Aspergillus fumigatus growth. Chest CT with intravenously contrast media injection showed pericardial effusion, partially loculated, anterior to the main pulmonary artery, and thickened costal cartilage along the seventh and eighth ribs, more pronounced on the left. Most of the findings were attributed to postoperative changes, and a definite diagnosis of osteomyelitis or fever origin could not be excluded. Gallium-67 scintigraphy and SPECT of the chest showed abnormal lambda-shaped linear uptake corresponding approximately to the xyphoid and bilateral lower costal cartilages.

A separate focus of increased uptake was noticed on the left mediastinal upper border [Figure]. Both findings were new, compared to a previous gallium scintigraphy. The CT and the SPECT were co-registered by an automatic algorithm based on normalized mutual information [4,5]. The fused images of the two modalities showed that the bilateral linear increased gallium uptake matched thickened costal cartilage, ribs and xyphoid bones observed on CT, therefore, chondritis and osteomyelitis of the xyphoid and bilateral adjacent costal cartilages, more extensive on the left, was diagnosed. The pathologic uptake next to the pulmonary artery matched small, contrast enhancing collections seen within the pericardial effusion, anterior to the pulmonary artery. The patient underwent wound debridement and was discharged with triazole, an oral antifungal treatment.

Comment
Normal postoperative chest CT findings in the first few weeks after surgery include enlarged cardiac silhouette, pneumomediastinum, subcutaneous emphysema and mediastinal widening [4,5]. These normal changes can mask the appearance of osteomyelitis, and the potential for fungal infection in the chest of an immunosuppressed organ recipient should not be overlooked.
of major survival-limiting complications including infections. Gallium-67 scintigraphy on the other hand is a sensitive, but not specific, method for demonstrating inflammation caused by several factors, among them infections. A major drawback of this modality is its low anatomical resolution.

Both the chest CT and the gallium-67 scintigraphy can be misleading in a postoperative patient, since they overestimate the severity of the findings. The CT/gallium-67-SPECT co-registration technique enables detection and localization of subtle findings hidden behind major post-transplantation, as this case demonstrates.

References:

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Capsule

Fleeting memories

How persistent is our memory, how is it maintained, and how can it be disrupted? It has recently been shown that PKM, a protein kinase C isoform, is critical for maintaining hippocampus-dependent spatial memory and long-term potentiation. Using a conditioning taste aversion paradigm, Shema and collaborators found that long-term memory could be erased by infusion of a PKM inhibitor, ZIP, into the insular cortex of rats. The activity of PKM was specifically involved in the storage of memories but not in their acquisition.

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Capsule

HRT in postmenopausal women

In their multicenter, randomized, placebo-controlled, double-blind trial, Vickers et al. investigated the long-term risks and benefits of hormone replacement therapy (combined hormone therapy versus placebo, and estrogen alone versus combined hormone therapy). The setting was general practices in the UK (384), Australia (91) and New Zealand (24). The participants were postmenopausal women aged 50–69 years at randomization. At early closure of the trial 56,583 had been screened, 8980 entered run-in, and 5692 (26% of target of 22,300) started treatment. The interventions were estrogen-only therapy (conjugated equine estrogens 0.625 mg orally daily) or combined hormone therapy (conjugated equine estrogens plus medroxyprogesterone acetate 2.5/5.0 mg orally daily). Ten years of treatment were planned, but the trial was prematurely closed during recruitment, after a median follow-up of 11.9 months (interquartile range 7.1–19.6, total 6498 women years) in those enrolled, after the publication of early results from the Women's Health Initiative study. The mean age of randomized women was 62.8 (SD 4.8) years. When combined hormone therapy (n=2196) was compared with placebo (n=2189), there was a significant increase in the number of major cardiovascular events (7 vs. 0, P = 0.016) and venous thromboembolisms (22 vs. 3, hazard ratio 7.36, 95% confidence interval 2.20–24.60). There were no statistically significant differences in numbers of breast or other cancers (22 vs. 25, hazard ratio 0.88, 0.49–1.56), cerebrovascular events (14 vs. 19, 0.73, 0.37–1.46), fractures (40 vs. 58, 0.69, 0.46–1.03), and overall deaths (8 vs. 5, 1.60, 0.52–4.89). Comparison of combined hormone therapy (n=815) versus estrogen therapy (n=826) outcomes revealed no significant differences. The authors conclude that hormone replacement therapy increases cardiovascular and thromboembolic risk when started many years after the menopause. The results are consistent with the findings of the Women's Health Initiative study and secondary prevention studies. Research is needed to assess the long-term risks and benefits of starting hormone replacement therapy near the menopause, when the effect may be different.

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