Iatrogenic Right Ventricular Laceration
Delayed Presentation after Abdominal Surgery

A 69-year-old man presented at our emergency department in marginal hemodynamic condition due to hemorrhagic shock and cardiac tamponade. Two months earlier, he had undergone total gastrectomy and left lobe hepectomy for invasive gastric cancer. Delayed iatrogenic laceration of the right ventricle, consequent to the abdominal procedure, was the uncommon cause of the massive hemopericardium. To our knowledge, this is only the 2nd case in the literature of a cardiac laceration after abdominal surgery. (Tex Heart Inst J 2000;27:302-3)

We herein describe the case of a patient who, 2 months after undergoing total gastrectomy and left lobe hepectomy for invasive gastric cancer, presented in marginal hemodynamic condition with acute cardiac tamponade caused by massive hemopericardium.

Case Report

In April 1999, a 69-year-old man was admitted at the emergency department of our hospital in marginal hemodynamic condition. Two months earlier, he had undergone total gastrectomy (with a Roux-en-Y esophageojejunal anastomosis) and left lobe hepectomy for invasive gastric cancer. Two hours before his admission, the patient had experienced a sudden onset of acute chest pain, which regressed rapidly and was followed, within a few minutes, by shortness of breath and severe hypotension.

At admission, inotropic support and fluid resuscitation were required. Twelve-lead electrocardiography excluded acute myocardial infarction. The patient was screened for aortic dissection by transthoracic echocardiography, which indicated substantial pericardial effusion but could not visualize the ascending aorta. The patient’s hemodynamic condition recovered enough to enable an exploratory contrast-enhanced computed tomographic scan of the chest. This revealed normal changes after the total gastrectomy and left lobe hepectomy. It also excluded aortic dissection or rupture and demonstrated the presence of a massive hemopericardium (Figs. 1A, B).

The patient was immediately transferred to the operating room to evacuate the hemopericardium through an exploratory sternotomy. In light of the patient’s recent history, his marginal hemodynamic condition due to hemorrhagic shock and cardiac tamponade led us to suspect erosion of a cardiac structure by gastric metastases to the pericardium. At the opening of the pericardium, about 2,500 cc of blood and fresh clots were evacuated. Upon examination of the cardiac structures, we detected a crater on the diaphragmatic surface of the right ventricle. This crater was approximately 10 mm in diameter and was bleeding freely inside the pericardium from a small tear on its bottom (Fig. 2). The crater was located 6 mm from the posterior descending artery.

To our surprise, we discovered that the lesion corresponded with a looped, heavy monofilament suture coming from below the diaphragm and protruding about 10 mm into the pericardial space. The ventricular laceration was successfully repaired, with the heart beating, using a single 4-0 polypropylene suture with pledgets. The patient’s postoperative course was uneventful, and he was discharged on postoperative day 4.

The surgeon who had performed the gastric and hepatic resection was contacted. He explained that the stitch had been placed to re-suspend the esophageojejunal anas-
tomosis to the diaphragm, and he reported that the postoperative course of the operation had been un-

eventful, with no sign of cardiac impairment or he-
modynamic dysfunction.

Discussion

Cardiac rupture is generally a fatal condition in which death is caused by a rapidly exsanguinating hemorrhage. However, if the rupture is small, and particularly if it involves the right ventricle, the hemopericardium that develops may impede the bleed-

ing through tamponade and the hemodynamic state may remain reasonably good, thereby enabling sur-
gical treatment.

Iatrogenic cardiac lacerations are rare, especially after abdominal surgery. We found only 1 case in the literature—a ventricular laceration that was produced by a liver retractor during laparoscopic Nissen fundo-
plication. In our case, the lesion derived from a su-
ture that had been passed through the diaphragm to re-suspend the esophagojejunal anastomosis to the diaphragm after gastric resection. It was evident that there had been a technical error.

This case indicates the danger of passing sutures through the diaphragm from below. Furthermore, it is interesting to note the late onset and the mecha-
nism of the delayed rupture. Two hypotheses may ex-
plain the late perforation of the ventricle free wall. The suture that had passed through the ventricular wall might gradually have divided the myocardial tissue. Alternatively, the thick suture lying on the pericardium might have come into contact with the ventricular wall and, over time, abraded it. In either of these cases, the excavation would have been facili-
tated by the movements of the heart.

The pain that accompanied the onset of symptoms is compatible with both hypotheses. From the shape of the crater on the ventricular wall it was impossible to determine which mechanism produced the laceration.

References

1. Firoozmand E, Ritter M, Cohen R, Peters J. Ventricular laceration and cardiac tamponade during laparoscopic Nis-