An unemployed, divorced 38-year-old man attempted to commit suicide by firing a crossbow bolt through his chest into the heart. He used a pistol crossbow manufactured by Barnett International Inc (Odessa, Fla), with a rated draw weight of 34 kg, an accuracy for 20 m, and a rated bolt velocity of about 45 m/s. The bolt entered the chest wall 4 cm below the left nipple in a cranio-lateral to inferiormedial direction and penetrated the mediastinum (Fig 1). The patient was found slightly intoxicated, conscious and cooperative without severe respiratory distress, and hemodynamically stable (blood pressure, 160/125 mm Hg; heart rate, 80 beats/min). The heel of the bolt projected 10 cm from the left parasternal entry point and moved in synchronization with the heart beat. Despite common guidelines for decision making in cases of penetrating chest injuries,1,2 the physicians in the emergency room of the receiving hospital performed a chest x-ray, an echocardiography, and a thoracic computed tomography scan. Computed tomography showed a crossbow bolt penetrating anteriorly through the mediastinum, with the tip of the bolt positioned in the myocardium without any signs of a pericardial tamponade, pneumothorax, or pleural effusion (Fig 2). With the projectile still in place, the patient underwent a median sternotomy and a longitudinal pericardiotomy. The pericardial space was empty when it was entered. There did not appear to be perforation of a ventricular chamber, but the pencil-like tip of the bolt penetrated the interventricular septum to a depth of 1 cm and lodged within approximately 1.5 mm of the left anterior descending artery (LAD) (Fig 3). There was no serious bleeding with the bolt in place, but diffuse hemorrhage from the myocardium followed its extraction. The cardiac wound repair was performed with 2 separate U-sutures with pericardial patch pledgets. The cardiorrhaphy sutures were placed below the LAD and deep into the myocardium away from the injury to prevent stenosis of the LAD. Cefuroxime was administered for prophylaxis. The patient’s recovery was uneventful, uncomplicated by myocardial ischemia or infarction.

DISCUSSION

Since the invention of efficient firearms, the use of the crossbow and consequent injuries from arrows has become rare. The type of arrowhead, either the pencil-like bolt tip described here or the hunting broadhead tip consisting of multiple

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**Fig 1.** Crossbow bolt penetrating anterior chest wall.

**Fig 2.** Computed tomography scan reveals crossbow bolt tip intramyocardially in left ventricle.
razor-edged vanes, dictates the injury pattern and is
decisive for the outcome of the victims.3,4 The con-
cical pencil-like bolt tip has no razor effect and thus
causes no incising injury. The principles of myocar-
dial repair are similar to those applicable to stab
wounds from knives and other “simple” spears.
Crossbows are accurate and deadly weapons,
although their missile energy exceeds the limit of
7.5 J prescribed in the German gun-control laws for
freely-sold weapons. No gun license is needed to
own or use a crossbow, at least in Germany.
Consideration to limit access to such weapons may
be appropriate.

REFERENCES