Pericardiocentesis Under Echocardiographic Guidance

We are writing in response to a recently published article by Vayre et al.1,2 describing their experience with pericardiocentesis under echocardiographic guidance in 110 patients with clinical tamponade. We congratulate the authors in their effort to disseminate their data regarding their experience on ‘echo-guided’ pericardiocentesis.

We noted that a subxiphoid approach was used in 109 of these 110 patients. Vayre and colleagues contend that a subxiphoid approach is the ‘classical’ approach for performing pericardiocentesis, citing the work of Kilpatrick et al.3 and Susini et al.4, which accounted for the experience of only a small group of patients.

It is of great concern that a misunderstanding of the state-of-the-art echo-guided pericardiocentesis procedure continues to be perpetuated in the medical community. The fact that 109 of 110 procedures in the Vayre series were undertaken using the subxiphoid approach indicates that the technique was not truly echo-guided, but rather pericardiocentesis via the subxiphoid approach following confirmation of presence of an effusion by echocardiography.

Echocardiographically guided pericardiocentesis is more than simply the identification of the presence of an effusion. The crux of the technique is that echocardiography is used specifically to define the optimal and safest entry site for pericardiocentesis. This is the point where the largest collection of fluid lies in closest proximity to the surface transducer, and where echocardiography confirms that no intervening structures, such as the liver or lungs, are present in the pathway that the needle will take. The angle of the transducer when the optimal entry site is identified defines the precise trajectory for the insertion of the needle.

The authors omitted discussion of the largest series ever published on the use of the echo-guided pericardiocentesis technique. In 779 consecutive therapeutic echo-guided pericardiocenteses the tap was performed safely, and the efficacy, in terms of reduced rate of recurrence, was substantially enhanced by use of extended catheter drainage. Major complications occurred in less than 3% of cases. In other original publications from the Mayo Clinic, the experiences of four subgroups have been described. These include effusions in patients with malignancy (341 procedures), postoperative effusions (245 procedures), cases of invasive catheter-based procedures leading to cardiac perforation and pericardiocentesis (92 procedures), and the pediatric series (94 procedures). In all these subgroups the ideal position for needle entry was directed by echocardiography. The most commonly chosen site, based on echocardiographic selection, was paracostal, accounting for approximately 70% of all procedures. A subxiphoid entry was defined as optimal in no greater than 20% of all procedures.

For most patients in our series, where echo-guided pericardiocentesis with extended catheter drainage was used as the primary treatment strategy, no further therapy was necessary. In our institution echo-guided pericardiocentesis with extended catheter drainage is now considered the primary procedure of choice for large or compressive pericardial effusions resulting from a wide spectrum of aetiologies. However, we regret that the discussion by Vayre et al.1 did not reflect findings stated in current literature, nor did it do justice to the time-tested technique of actually directing and improving the efficacy and safety of the procedure using echocardiography.

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References

Author’s Reply
We thank Drs Tsang and Seward for their interesting comments. The Mayo Clinic’s important experience in echocardiographically guided pericardiocentesis was cited in our paper.1 However, the approach we described is technically different. In Europe, the Marfan’s approach, or different. In Europe, the Marfan’s approach, or subxiphoid puncture proposed by Marlan2–4, is routinely used in cardiac tamponade, in which a swinging heart is frequently present. The most common approach for pericardiocentesis is left xiphophostal, with the needle aimed towards the left shoulder. Rare vascular complications, such as puncture of the left mammary artery, have been described. The Mayo Clinic group advocates a puncture site where the pericardial fluid is closest to the transducer, with the needle track avoiding the heart or any underlying vital structure. The apical approach is

Eur J Echocardiography (2001) 2, 68–69

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