Use of “Medicath” For Safe Pericardiocentesis

Sir,

Pericardiocentesis is a life saving procedure for patients in cardiac tamponade. It is also required to evaluate the cause of chronic or recurrent pericardial effusion. However, compared to pleural and peritoneal paracentesis, needle aspiration of pericardial fluid is a relatively hazardous procedure. Even in good hands it is associated with morbidity and occasional mortality.\(^1\) At higher centers also the rate of major complications reported from pericardiocentesis are about 2-3\%.\(^2\) These complications are due to following reasons:

(a) Penetration of needle into the myocardial cavity and injury to heart chambers particularly thin walled right atrium and right ventricle which bleed briskly causing haemopericardium.

(b) Laceration of coronary vessels.

(c) Puncture of adjacent, lung causing pneumothorax.

(d) Arrhythmia induced by direct contact of needle with the ventricular surface.

Most of these complications occur not during initial insertion of needle but during subsequent manipulation of needle or during later part of the procedure when amount of fluid decreases in pericardial cavity.

To minimize these complications specialists at higher centers have suggested use of a soft guide wire and catheter for pericardiocentesis.\(^3\) In this method, once the pericardial space is reached a soft-floppy tip guidewire is passed through the needle and needle is withdrawn completely. A multiholed soft catheter is then introduced over the guide wire and connected to a syringe at the other end. Pericardial fluid is then sucked through it. However, nonavailability of such multi-holed catheter and guide wire at primary health centers of our country and lack of training of most clinicians in use of these devices limits the utility of this approach.

At our center we have used “Medicath” (routinely used for intravenous line) as a safe alternative option for draining pericardial fluid under the following steps:

1. Site of pericardial effusion and its depth from skin surface was evaluated in detail by 2-D echocardiography. Aspiration was done in semirecumbent position to allow gravitation of fluid along the inferior surface of heart.

2. Skin was shaved, cleaned with antiseptic solution and infiltrated with 10 ml of 2\% xylocaine solution.(Fig.1A)

3. Medicath IV Cannula consisting of an 18 gauge metallic needle of 4.5 cm length, covered with a soft Poly tetra fluoro ethylene (PTFE) cannula and connected to a 3 way stop cock was used.

4. The Medicath was inserted posteriorly in the direction of the left shoulder at an angle of 45\(^\circ\) to the skin(Fig.1B). Point of entry in skin was kept away from costal margin rather than manipulating the medicath just under the costal margin. With avoiding of the costal margin and proper angulation of needle we did not face any problem of kinking of medicath on removal of needle. The direction and depth of medicath were guided by prior echocardiographic examination.

5. Once it reached the pericardial cavity, needle was stabilized and cannula was advanced in the pericardial cavity (Fig.1C). The needle was then withdrawn leaving the cannula inside safely.

6. The other end of cannula was connected to a syringe and IV set through the 3 way stop cock and pericardial fluid was drained through it (Fig.1D).

We have used this procedure safely on 30 patients of cardiac tamponade. Adequate amount of pericardial
fluid could be drained in each case as confirmed by repeat echocardiography. Amount of fluid aspirated ranged from 450 ml to 1000 ml. Etiology was tubercular in 22 patients, pyogenic in 3 patients, malignant (secondaries) in 3 cases and amoebic in 2 patients. Three patients developed transient bradycardia with hypotension which quickly reversed with injection Atropine given intravenously. Removing the needle soon after penetration of pericardial cavity and aspirating through blunt medicath significantly reduces risk of needle induced injury. Drainage may not be adequate if there are septa. This problem, however, remains even if a catheter is used. Procedure may not be useful in very thick fluid and fluid collected in areas of pericardium beyond the reach of medicath. We did not attempt diagnostic aspiration of small amount of fluid (diastolic echofree space of less than 1 cm). Use of medicath, like any other needle, may not be safe in such cases.

SR Mittal*, Monika Maheshwari**
*Senior Professor and Head, Department of Cardiology; **Resident, Department of Medicine, JLN Medical College, Ajmer, Rajasthan.
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