

Therapeutic Pericardiocentesis Under the Guidance of Transthoracic Echocardiography with the Use of Agitated Saline Contrast



Ahmet Çağrı Aykan¹, Can Yücel Karabay², Regayip Zehir², Banu Şahin Yıldız³

¹ Ahi Evren Chest Cardiovascular Surgery Training and Research Hospital, Clinic of Cardiology, Trabzon, Turkey

² Kartal Koşuyolu High Specialization Training and Research Hospital, Clinic of Cardiology, İstanbul, Turkey

³ Dr. Lütfi Kırdar Kartal Training and Research Hospital, Clinic of Cardiology, İstanbul, Turkey

ABSTRACT

Cardiac tamponade is a life-threatening condition requiring urgent intervention. It may either be drained surgically or percutaneously. Percutaneous drainage of pericardial effusion bears the risk of laceration and perforation of the myocardium and the coronary vessels, air embolism, pneumothorax, dysrhythmias, puncture of the peritoneal cavity and abdominal viscera, internal mammary artery fistula, acute pulmonary edema, and purulent pericarditis. Here, we report an easy and safe approach for pericardiocentesis under the guidance of agitated saline contrast injection through a Seldinger needle before inserting guidewire and catheter. This cheap, easy, feasible, and comfortable method of injection of agitated saline contrast before the insertion of guidewire and catheter may prevent the undesired complications.

Key Words: Pericardiocentesis; cardiac tamponade; agitated saline; contrast; echocardiography

Transtorastik Ekokardiyografi Kılavuzluğunda Yapılan Terapatik Perikardiyosentezde Kontrast Madde Olarak Ajite Serum Kullanılması

ÖZET

Kardiyak tamponad acil müdahale gerektiren, hayatı tehdit eden bir hastalıktır. Biriken sıvı cerrahi ya da perkütan yol ile boşaltılabilir. Perikardiyal efüzyonun perkütan yol ile boşaltılması, miyokardiyal ve koroner laserasyon, perforasyon, hava embolisi, pnömotoraks, aritmi, periton yaralanması, abdominal organ hasarı, internal mamariyen arter fistülizasyonu, akut pulmoner ödem ve pürülan perikardit riski taşır. Biz bu yazıda perikardiyosentez için kolay ve güvenli bir metod olarak, perikardiyal boşluğa kateter ve klavuz tel yerleştirilmeden önce Seldinger iğnesinden kontrast amaçlı ajite serum uygulanan bir olguyu sunuyoruz. Basit, rahat ve kolay uygulanabilir bir yöntem olması nedeniyle kateter ve kılavuz telin perikardiyal boşluğa yerleştirilmesinden önce uygulanan ajite serum kontrast ile bu istenmeyen komplikasyonların önüne geçilebilir.

Anahtar Kelimeler: Perikardiyosentez; kardiyak tamponad; ajite serum; kontrast; ekokardiyografi

INTRODUCTION

Echocardiography-guided pericardiocentesis is lifesaving in patients with cardiac tamponade. Echocardiography should identify the shortest route by which the pericardium can be entered through the intercostal space. The feasibility is high (93%) in patients with anterior effusion > 10 mm, while the rate of success is only 58% with small, posteriorly located effusions⁽¹⁾. Here, we report an easy and safe approach for pericardiocentesis under the guidance of agitated saline contrast injection through a Seldinger needle before inserting guidewire and catheter.

CASE REPORT

A 47-year-old woman with primary amyloidosis presented with dyspnea. Physical examination was normal except slight tachycardia, hypotension (90/50 mmHg), and shallow heart sounds. Electrocardiography revealed decreased voltage. Telecardiography showed increased cardiothoracic ratio. A swinging heart was evident on transthoracic echocardiography; thus, pericardiocentesis was planned (Figure 1A). The patient was monitored, and local sedation with 8 mg of prilocaine was administered. A Seldinger needle was introduced through the right subxiphoid area directed toward the left shoulder at 30° with negative aspiration under the guidance of transthoracic echocardiography (Figure 1B). After the aspiration of serous fluid, 10 mL of agitated saline contrast was administered through the needle and the contrast agent was visualized in the whole pericardial space, not inside the cardiac chambers (Figure 2). Then, we

Correspondence

Ahmet Çağrı Aykan

E-mail: ahmetaykan@yahoo.com

Submitted: 13.11.2013

Accepted: 24.11.2013

@ Copyright 2016 by Koşuyolu Heart Journal.
Available on-line at
www.kosuyoluheartjournal.com

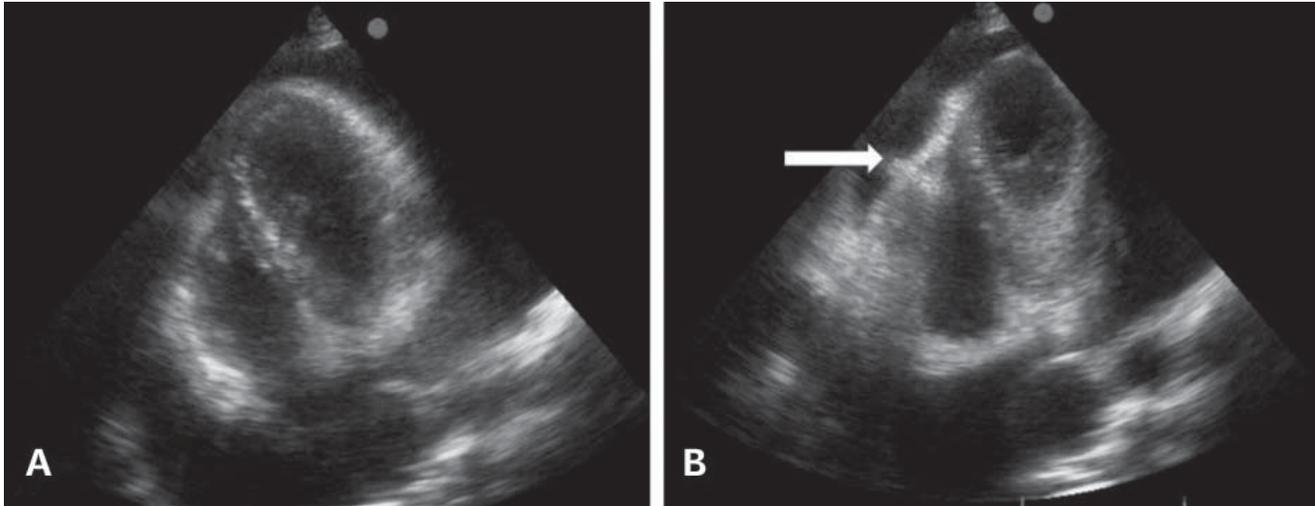


Figure 1. (A) Huge pericardial effusion surrounding the heart was evident on transthoracic echocardiography. (B) Arrow indicates the Seldinger needle in the pericardial space.

inserted a J-tip guidewire, and introduced the catheter into the pericardial space. A total of 1200 mL of fluid was successfully drained over 36 h, and the patient was discharged uneventfully.

DISCUSSION

Pericardiocentesis is indicated for effusions causing hemodynamic compromise (cardiac tamponade), for effusions measuring over 20 mm in diastole, or for diagnostic purposes⁽¹⁾. Pericardiocentesis may be performed safely under the guidance of either fluoroscopy or echocardiography with cardiac monitoring⁽²⁻⁴⁾. The subxiphoid approach is usually used, which is extrapleural and avoids injury to the coronary and internal mammary arteries. Contrast injection is generally performed under fluoroscopic guidance; the injection of agitated saline contrast under echocardiographic guidance is a new method. Pericardiocentesis has serious complications, including laceration and perforation of the myocardium and the coronary vessels,

air embolism, pneumothorax, dysrhythmias, puncture of the peritoneal cavity and abdominal viscera, internal mammary artery fistula, acute pulmonary edema, and purulent pericarditis⁽¹⁾. Even under echocardiographic guidance, major complications, including perforation and rupture, have been reported in 1.3-1.6% cases^(2,4-6). Therefore, before the insertion of catheter into the pericardial space, it is crucial to be sure of the location of the needle.

CONCLUSION

In conclusion, injection of agitated saline contrast before the insertion of guidewire and catheter is a cheap, easy, feasible, and comfortable method and may prevent undesired complications.

REFERENCES

1. Maisch B, Seferović PM, Ristić AD, Erbel R, Rienmüller R, Adler Y, et al; Task Force on the Diagnosis and Management of Pericardial Diseases of the European Society of Cardiology. Guidelines on the diagnosis and management of pericardial diseases executive summary; the task force on the diagnosis and management of pericardial diseases of the European society of cardiology. *Eur Heart J* 2004;25:587-610.
2. Tsang TS, Enriquez-Sarano M, Freeman WK, Barnes ME, Sinak LJ, Gersh BJ, et al. Consecutive 1127 therapeutic echocardiographically guided pericardiocenteses: clinical profile, practice patterns, and outcomes spanning 21 years. *Mayo Clin Proc* 2002;77:429-36.
3. Maisch B, Ristic AD. Tangential approach to small pericardial effusions under fluoroscopic guidance in the lateral view: the halo phenomenon. *Circulation* 2001;103(Suppl A):730.
4. Tsang TS, Barnes ME, Hayes SN, Freeman WK, Dearani JA, Butler SL, et al. Clinical and echocardiographic characteristics of significant pericardial effusions following cardiothoracic surgery and outcomes of echo-guided pericardiocentesis for management: Mayo Clinic Experience 1979-1998. *Chest* 1999;116:322-31.
5. Tsang TS, Barnes ME, Gersh BJ, Bailey KR, Seward JB. Outcomes of clinically significant idiopathic pericardial effusion requiring intervention. *Am J Cardiol* 2003;91:704-7.
6. Tsang TS, Freeman WK, Barnes ME, Reeder GS, Packer DL, Seward JB. Rescue echocardiographically guided pericardiocentesis for cardiac perforation complicating catheter-based procedures. The Mayo Clinic experience. *J Am Coll Cardiol* 1998;32:1345-50.

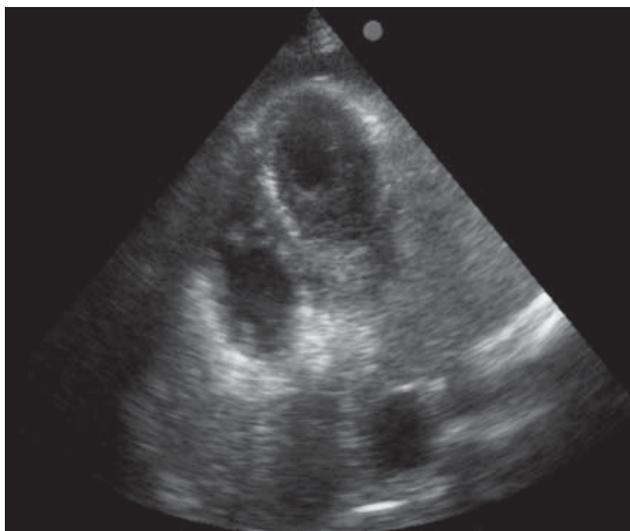


Figure 2. Agitated saline contrast agent filling the pericardial space.