

Closed Pericardial Biopsy

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SUMMARY

A study was undertaken to determine the value of closed pericardial biopsy in establishing the histological diagnosis in 23 patients with confirmed pericardial effusion.

Histological examination revealed a tuberculous aetiology in 17 cases, pyogenic in 3, post-traumatic in 2 and viral in 1.

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Tuberculosis is the most common cause of pericardial effusion in South Africa, accounting for 80% of cases in one series.¹ In half these cases the diagnosis was made on clinical grounds. Viral, and rarely pyogenic, pericardial disease may mimic tuberculous effusion. It is correct to assume that many cases of viral aetiology may be treated as tuberculosis and *vice versa*. Histology is invaluable in this situation. A safe closed biopsy of the pericardium as an alternative to open biopsy is therefore a logical investigation.

We undertook this study to determine the value and safety of this procedure in the diagnosis of pericardial disease.

PATIENTS AND METHODS

Twenty-three patients with pericardial effusions were studied. In 20 cases the diagnosis was confirmed by carbon dioxide insufflation studies and cardiac scans. In all cases the presence of an effusion was confirmed by aspiration via the xiphisternal route.

The instrument used is a hook biopsy needle (Fig. 1), manufactured by Becton, Dickinson and Co., Rutherford, New Jersey, USA. The instrument² and technique³ will be reviewed. The instrument consists of an 11-gauge needle with a sharp cutting edge into which fits, interchangeably, a 13-gauge needle or a blunt-tipped hook biopsy trocar; the latter has a metal pointer attached to the hub to indicate the direction of the hook.

After suitable anaesthesia the presence of fluid is verified with a small-bore aspirating needle to which the chest lead of an ECG recorder is attached. The depth at which fluid is obtained is noted before the needle is withdrawn. A hook biopsy needle with the inner needle (Fig. 1, A) is introduced to this depth and aspiration

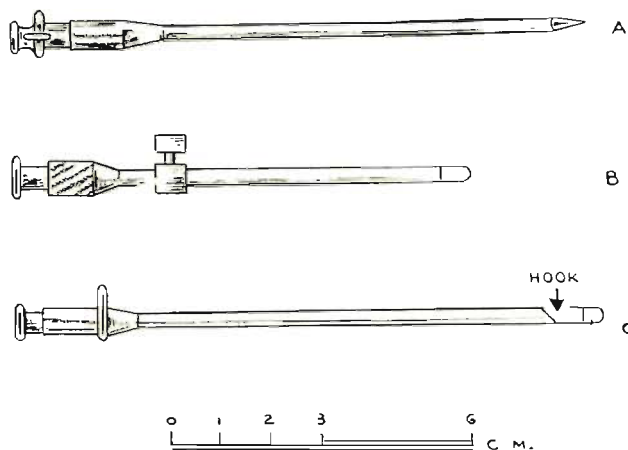


Fig. 1. A = inner puncture needle; B = outer needle with cutting edge; and C = hook needle.

confirms that the needle is in the pericardial sac. The inner needle is withdrawn and the hook needle (Fig. 1, C) is passed inside the outer needle. Lateral pressure is applied in the direction of the indicator knob and the hook needle is withdrawn until it catches pericardium. The outer cutting needle (Fig. 1, B) is then advanced, rotating it to incise tissue held by the hook needle. Repeat biopsies should be done.

RESULTS

These are set out in Table I.

TABLE I. RESULTS OF PERICARDIAL BIOPSY IN 23 CASES

No. of cases	Cause
17	Tuberculosis
3	Pyogenic
2	Post-traumatic
1	Viral

DISCUSSION

Sanghvi⁴ and Bawa⁵ described the technique of closed pericardial biopsy using a Vim Silverman needle, but reported only 7 cases. Cope² described the value of the hook biopsy needle, mainly for pleural, peritoneal and synovial biopsies. He used the hook needle to biopsy pericardium in 7 cases, but obtained diagnostic tissue in only 1 case. We have had success in 23 cases and no failures in the presence of an effusion. There were no complications attached to the procedure.

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Tuberculosis

In effusions caused by tuberculosis a typical granulomatous reaction was reported in 12 cases, and acid-fast bacilli were observed in 4 of these. In the remaining 5 cases a chronic granulation tissue response was noted and in 1 of these acid-fast bacilli were cultured from the fluid.

The following case illustrates some interesting features and the value of biopsy.

A 13-year-old Black female presented with a history of right pleuritic chest pain and a dry cough with fever for one week. She looked ill and had left lower lung lobe consolidation and signs of pericardial effusion with tamponade. The chest X-ray film confirmed the above findings and showed a raised right hemidiaphragm. The haemoglobin was 11.2 g/100 ml, white cell count 8 300/mm³ and the ESR 5 mm Westergren. The amoebic slide agglutination test was negative.

A clinical differential diagnosis of pyogenic, amoebic or possibly tuberculous pericardial effusion was made. Pericardial aspiration produced 100 ml of yellow fluid, and a hook biopsy was performed. The histology showed a typical granulomatous reaction and acid-fast bacilli were cultured from the fluid. She soon developed signs of tamponade and aspiration yielded nothing. Prednisone 15 mg every 6 hours resulted in a dramatic improvement. Months later she developed signs of constriction.

The short history, the elevated right hemidiaphragm, the lobar consolidation and the macroscopic appearance of the pericardial fluid were against a tuberculous aetiology. Hook biopsy and culture of the fluid resolved the problem. The value of steroids in ensuring a rapid remission of effusion and in the suppression of inflammation in tuberculous pericarditis is discussed elsewhere.⁹

Pyogenic

In 3 cases an acute inflammatory reaction with fibrinopurulent exudate was observed. In 2 cases pus was aspirated and biopsy provided no additional information. In 1 patient who presented with an insidious history, sero-sanguinous fluid was obtained on aspiration. Hook

biopsy showed a typical pyogenic inflammatory reaction. In these cases the pericardial effusion was associated with pneumonia, usually the left lower lobe.

Post-traumatic

Biopsy specimens were taken from 2 cases of post-traumatic pericardial effusion. Histology showed an inflammatory granulation tissue response but provided no additional information.

Viral

One patient, a 20-year-old male, presented with a one-week history of an acute febrile illness associated with diarrhoea, chest pain and pericardial effusion. Hook biopsy revealed an acute inflammatory exudative reaction on histology. Viral studies were not performed, but his clinical course and biopsy result strongly suggested a viral aetiology. We feel pericardial biopsy is a valuable tool for differentiating viral from tuberculous pericardial effusion, especially in areas where viral studies are not readily available.

CONCLUSION

We have found this procedure to be safe and without complications. The histology in most cases confirmed the clinical diagnosis. Histology is valuable in distinguishing tuberculous from viral aetiologies, and this has therapeutic implications. We feel that more studies on the value of closed pericardial hook biopsy are warranted.

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