

Needle injury to the heart

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INTRODUCTION

Over 160 cases of injury to the heart by pins and needles have been reported (Hermoni *et al.*, 1986). These objects reached the heart by a number of routes including embolization and penetration from adjacent organs after ingestion. However the most common mode of injury was by direct transthoracic penetration and the majority of these were accidental in nature.

We present the history of a 22-year-old male psychiatric patient who deliberately inserted a sewing needle into his heart via the chest wall. The difficulties in assessing the number of foreign bodies and their location within the thorax are discussed.

CASE REPORT

A 22-year-old male was referred to the A&E Department from a local psychiatric hospital, where he was an inpatient undergoing treatment for a personality disorder with associated depression. He had informed the psychiatric nursing staff that he had inserted two sewing needles into his chest three days previously. He had a history of deliberate self harm and it was not known where he obtained the needles. When seen in the A&E department his story changed to one needle inserted on the morning of his presentation. Radiographs taken at the referring psychiatric hospital demonstrated a single needle on the posteroanterior view but apparently two parallel needles in the lateral view (Figs 1 & 2).

The patient was well and in no discomfort. On examination there were several puncture marks midway between the xiphisternum and left nipple but no needles were palpable subcutaneously. Pulse rate was 72 min^{-1} and blood pressure 105/60 mmHg. An electrocardiograph showed an injury pattern with ST segment elevation in the lateral leads (Fig. 3).

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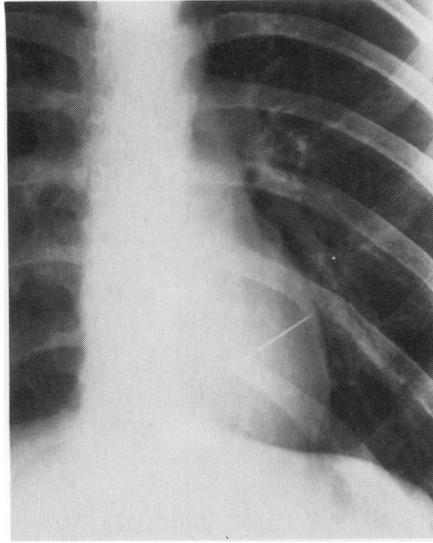


Fig. 1. Posteroanterior chest X-ray.

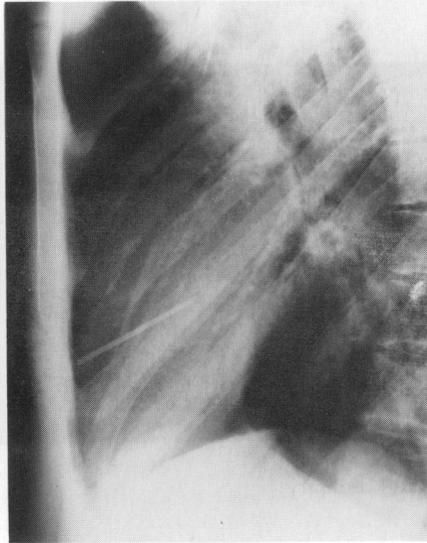


Fig. 2. Lateral chest X-ray.

Computerized tomography (CT) of the chest (Fig. 4) showed that the needle or needles entered the heart rather than being confined to the chest wall, but it was not possible to be specific about the exact location from the scan.

The patient was transferred to the regional cardiothoracic unit. At operation a single needle was found to have penetrated the left anterior descending coronary

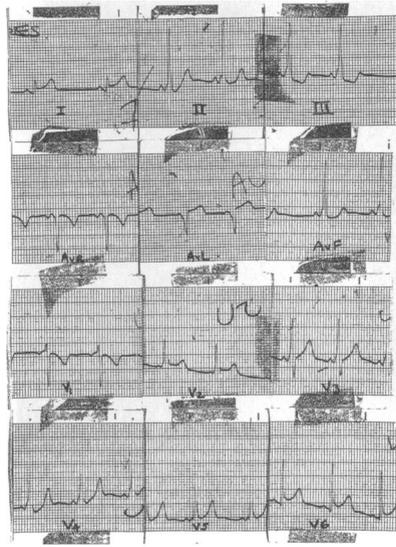


Fig. 3. Electrocardiograph showing ST elevation in the lateral leads.



Fig. 4. CT scan of thorax at the level of injury.

artery and entered the substance of the left ventricular wall. This was removed. Further exploration with cardiopulmonary bypass, and X-ray screening failed to reveal a second needle either in the myocardium or elsewhere in the body.

The patient made an uneventful postoperative recovery. Electrocardiograph appearances returned to normal within 3 days and he was transferred back to the psychiatric hospital 1 week later.

DISCUSSION

This case was complicated by the unreliability of the history, and the apparent presence of two needles on the lateral chest X-ray. This was attributed by the radiologist to a double image created by movement of the heart during the exposure required for a lateral chest view (approx 0.08 s). This compares with a shorter exposure time of approximately 0.03 s required for an posteroanterior film. The CT scan assisted in demonstrating that the needle was in the heart but was unable to detect the exact location. CT failed to confirm the exact number of needles, again probably due to cardiac motion during the CT exposure time (approx 0.09 s). There has been one previous report of the use of CT scan for localization of intracardiac needles in which the CT was used to confirm the findings already obtained by echocardiography (Hermoni *et al.*, 1986). There are several reports of the use of echocardiography for this purpose (Hsiung, 1985), (Hoshino *et al.*, 1984), (Portek & Wright, 1981), and for the confirmation and localisation of other intracardiac foreign bodies (Fyfe *et al.*, 1987). (Robison *et al.*, 1988). This would appear to be the investigation of choice and would have settled the issue of whether there was one needle or more.

While there have been cases recorded of long term survival with needles and other foreign bodies in the heart (Schechter & Gilbert 1969), (Barrett 1950), early removal is advised. Mortality in patients sustaining needle injury to the heart may approach 50%, the majority due to cardiac tamponade (Schechter & Gilbert 1969). Subsequent problems encountered following intracardiac foreign bodies include endocarditis, pericarditis, embolization, fistula formation and myocardial damage.

In conclusion we would advise echocardiography rather than CT scan for accurate detection and localization of foreign bodies within the heart.

REFERENCES

- Barrett N. R. (1950). Foreign bodies in the cardiovascular system. *British Journal of Surgery* **37**, 416–445.
- Fyfe D. A., Edgerton J. R., Chaikhouni A. & Kline C. H. (1987). Preoperative localization of an intracardiac foreign body by two-dimensional echocardiography. *American Heart Journal* **113**, 210–212.
- Hermoni Y., Engel P. J. & Gallant T. E. (1986). Sequelae of injury to the heart caused by multiple needles. *Journal of the American College of Cardiology* **8**, 1226–1231.
- Hoshino S., Ohsawa M., Amano S., Nishiguchi K. & Sakai Y. (1984) Needle in the left ventricle: report of a case with successful removal. *Nippon Kyobu Geka Gakkai Zasshi* **32**(7), 1086–1089.
- Hsiung M. C., Chen C. C., Wei J., Wang D. J., Shieh S. M., Chiang B. N. & Sung P. K. (1985) Two-dimensional echocardiographic demonstration of multiple needles on the heart. *American Journal of Cardiology* **55**, 1245.
- Portek I. J. & Wright J. S. (1981). Needle in the heart. *British Heart Journal* **45**, 325–327.
- Robison R. J., Brown J. W., Caldwell R., Stone K. S. & King H. (1988). Management of asymptomatic intracardiac missiles using echocardiography. *Journal of Trauma* **28**, 1402–1403.
- Schechter D. C. & Gilbert L. (1969). Injuries of the heart and great vessels due to pins and needles. *Thorax* **24**, 246–253.