were taken over less than 15 minutes and less than 30 ml of saline was infused.

The table gives the results. The lowest value measured for each patient occurred when readings were taken from the sternal angle with the patient's torso at 45°. The highest values were from the mid-axillary line with the patient lying flat. The range of individual variation with different postures and reference points was 6-22 cm H_2O. The mean (SD) difference between central venous pressure measured with the patient flat and that measured with the patient's torso at 45° was 4·6 (3·6) cm H_2O when measured from the sternal angle ($p<0·001$) and 1·7 (3·7) cm H_2O from the mid-axillary line ($p<0·03$).

Comment

In surgical recovery areas, accident and emergency departments, and intensive care units central venous pressure is usually measured with the patient supine. After transfer to general wards it is more commonly measured with the patient sitting up in bed. Assuming the same reference point is used, the mean difference in the recorded measurements will be 4·6 cm H_2O from the sternal angle and 1·7 cm H_2O from the mid-axillary line. However, taking two standard deviations from the mean, there will be some patients in whom the disparity may be as great as 11·8 cm H_2O and 9·1 cm H_2O respectively. This considerable variation results from many factors, including thoracic morphology, compliance of perivascular tissues, and venous tone.[3] Unless doctors appreciate that such variation can exist without reflecting any change in the circulating volume, inappropriate management decisions may be made. It is essential that, wherever possible, the same method for measuring central venous pressure is used for each recording taken from a patient and that all readings must be qualified by the anatomical reference point and the patient's posture at the time of recording.

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Pneumothorax: a complication of fine needle aspiration of the breast

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Iatrogenic pneumothorax is a recognised complication of subclavian cannulation, intercostal nerve block, chest aspiration, needle aspiration lung biopsy,[1] and supraclavicular brachial plexus block.[2] Fine needle aspiration cytology is a standard procedure in diagnosing breast lumps[3,4] and has few complications.[4] Indeed, most published papers do not mention complications happening during this procedure, which suggests that clinicians are unaware that serious complications may occasionally occur. The one major report that did present complications identified only minor bruising, which developed in a fifth of 1655 cases.[4] Pneumothorax occurring after fine needle aspiration of the breast has not to our knowledge been reported; we present seven such cases.

Case reports

The table shows the clinical details of seven cases of iatrogenic pneumothorax after fine needle aspiration of breast lumps for diagnostic purposes. The cases occurred in the breast clinics of three teaching hospitals in Britain, in a clinic at a district general hospital, and in a general practice surgery over a period of 3 years. The two cases from centre A (cases 1 and 2) occurred during a 12 month period in which 449 solid lumps were aspirated for cytology and around 500 cysts were aspirated. No further cases have been reported in a subsequent 12 month period, giving a rough incidence of 1 in 1000 aspirations.

Comment

Symptomatic iatrogenic pneumothorax occurs rarely after fine needle aspiration of lumps in the breast, but clinicians performing such procedures should be aware of this potentially serious complication. We cannot calculate the exact incidence of this complication as many thousands of aspirations have been performed in the centres as a whole and, from experience of other procedures, asymptomatic pneumothoraces probably also occur. In most of our series the aspirations were performed at the periphery of the breast or in the axilla. Here the breast depth is minimal and proper fine needle aspiration technique, in which multiple passes are performed at different angles transfixing the breast lump, increases the risk of inadvertently breaching the pleura. Also, most breast lumps occur in the outer half of the breast and so more aspirations are performed there. In aspirating lumps at the periphery of the breast clinicians should try to pass the needle parallel to the chest wall rather than at right angles to it, as is conventional teaching.

Because this complication is rare, routine chest radiography after aspiration is not indicated. Patients should, however, be asked about new symptoms before being allowed home. In our study the patients presented late because they assumed that pain was a normal part of the aspiration procedure and they did not report the immediate pain from the pleural breach to the doctor in the clinic. Clinicians performing aspirations should therefore perhaps explain to their patients that chest pain persisting after the needle has been withdrawn is abnormal.

Patients who develop dyspnoea or any immediate

Clinical details of seven cases of iatrogenic pneumothorax after fine needle aspiration of the breast

Case No	Setting	Age (years)	Final diagnosis	Site of lesion	Grade of aspirator	Onset of symptoms of pneumothorax	Time to presentation (hours)	Pneumothorax managed by	Method of management
1	Teaching hospital A, breast clinic	43	Cyst	Upper outer quadrant	Registrar	Immediate	4	General physician	Chest drainage
2	Teaching hospital A, breast clinic	50	Benign nodularity	Upper outer quadrant	Senior house officer	Immediate	48	Chest physician	Observation
3	General practice	33	Fibroadenoma	Axillary tail	Principal general practitioner	Immediate	72	Chest physician	Aspiration
4	Teaching hospital B, breast clinic	45	Lymph node	Axilla	Registrar	Immediate	Immediately	Surgeon	Observation
5	Teaching hospital C, breast clinic	42	Benign lump	Upper outer quadrant	Registrar	6 hours	24	General physician	Chest drainage
6	Teaching hospital C, breast clinic	37	Benign lump	Upper outer quadrant	Registrar	6 hours	48	General physician	Chest drainage
7	District general hospital	37	Benign nodularity	Deep	Consultant	Immediate	48	General physician	Chest drainage

pain in the chest or tip of the shoulder should be examined and have chest radiography performed. If pneumothorax is confirmed the patient should be referred to a respiratory physician. Such patients tend not to have primary lung disease and so their case will be amenable to observation or simple aspiration of the pneumothorax, which can often be performed as an outpatient procedure, avoiding the trauma of chest drainage.[5] When the pneumothoraces in our series were managed by general physicians chest drainage was used, which generally amounts to overtreatment in such cases.

Clinicians should be aware that pneumothorax is an accepted but rare complication of fine needle aspiration of lumps in the breast.

We thank the surgeons concerned for allowing us to report these cases.

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Who is your general practitioner?

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Follow up of patients discharged from hospital requires closer cooperation between the hospital and community services. The general practitioner is the most appropriate person to link the various professionals concerned. On perusing the case notes of patients in this unit we noticed that many of them did not contain the name of the patient's general practitioner. We wondered whether this was an administrative error or whether the patients did not have a general practitioner. We compared a group of forensic psychiatry patients with a group of general psychiatric patients and a group of general medical patients to see how many of them were registered with a general practitioner.

Patients, methods, and results

We looked at the notes of all the inpatients in this unit, the acute psychiatric unit at Hope Hospital, and two general medical wards at Hope Hospital on 15 January 1991. There were 65 forensic psychiatry patients, 66 patients with acute psychiatric disease, and 59 general medical patients. The information that we collected from the clinical notes included the name of the general practitioner, the legal status of the patient, any psychiatric history, and the provisional diagnosis. If the general practitioner's name was not recorded on the admission sheet we asked the patients whether they had a general practitioner. If they did not know who their general practitioner was we asked the local family health services authority if they were registered. The data were analysed with a χ^2 test.

Details of patients whose case notes did not contain their general practitioner's name

	Forensic psychiatry patients	Acute psychiatric patients	General medical patients
General practitioner not recorded	41	13	9**
General practitioner unknown to patient	12	8	4*
Diagnosis:			
Schizophrenia	11	7	
Personality disorder	1	1	
Detained under section of Mental Health Act	11	2	
Male	12	8	4
Single	11	7	4
Unemployed	11	8	4
No address	4	1	3
Psychiatric history	11	7	2
Source of admission:			
Prison	5		
Special hospital	4		
District general hospital	2		
Police station	1		
Community		8	4
Patient unknown to local family health services authority	5		

*p<0·05, **p<0·02 compared with forensic psychiatry patients.

The general practitioner's name was not documented on 59 admission sheets. Twenty patients did not know their general practitioner's name and five patients were not registered with the family health services authority at their last address. Patients who did not know the name of their general practitioner were more likely to be young, single, male, or unemployed, or to have schizophrenia, and their address was less likely to be documented in their notes. Patients in the regional secure unit were significantly less likely to have a general practitioner (table).

Comment

Our study showed that the patients' details were incompletely documented in some cases. This may be partly because some patients are disturbed and acutely ill on admission so that the details cannot be obtained. In these cases this information should be collected later. An unacceptably high proportion of patients were not registered with a general practitioner. These patients were more likely to be single, unemployed, and homeless; these are the very patients who need support and care in the community. Psychiatric patients without general practitioners are particularly at risk of relapsing because without encouragement they may not comply with treatment. Early on in an admission patients should be registered with a general practitioner, who should participate in planning follow up care.

Section 117 of the Mental Health Act 1983 states that people who are detained under sections 3, 37, 47, and 48 of the act must receive follow up care on discharge, which necessitates cooperation between the hospital, community services, and general practitioner.[1] Eleven of the 12 forensic psychiatric patients who did not have a general practitioner had been detained under the Mental Health Act. It is important to identify these patients early so that they can be registered with a general practitioner where they live and their follow up can be planned. The forensic psychiatry service is regionally based, and patients may be discharged to districts some distance away, so that the importance of the general practitioner in monitoring these patients and liaising with the forensic team cannot be overstated.

Patients admitted to hospital should be followed up, and this necessitates the participation of the general practitioner. Some patients will still refuse to cooperate, but if the general practitioner does participate care should be provided for most patients.

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