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(Accepted 15 May 1990)

Lesson of the Week

Concealed haemorrhage in patients nursed on an air fluidised bed

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Fatal occult blood loss may occur when an air fluidised bed is used

Concealed haemorrhage is a potential cause of inadequate fluid replacement.¹ We present two cases in which blood drained rapidly into the chamber of an air fluidised (Clinitron) bed. The loss was not obvious despite close clinical supervision and full invasive monitoring in the intensive care unit.

Case reports

Case 1—A 16 year old boy was admitted after a road traffic accident. He had a degloving injury of his left buttock; fractures of his ankle, pelvis, tibia, and clavicle; a chest injury; and a retroperitoneal haematoma. His injury severity score was 41. A defunctioning colostomy and skin grafting were performed. During these procedures he required 16 units of blood and coagulation factors but developed a coagulopathy. In the intensive care unit the wounds oozed slowly, necessitating further replacement of blood and blood products and a second operative exploration. After this he was nursed on an air fluidised bed. There was no obvious evidence of external bleeding, but in retrospect the pulmonary artery occlusion pressure and haemoglobin concentration remained low despite further transfusion. For further assessment part of the woven cover sheet of the bed was removed, and the beads were found to be heavily soaked with blood. Further surgery was arranged, but he became acutely hypotensive and had an asystolic cardiac arrest.

Case 2—An 18 year old man who had been trapped in a burning vehicle had 60% burns to his torso and legs and a smoke inhalation injury. He required transfusion of albumin and blood, and noradrenaline was given to raise the blood pressure.^{2,3} He was transferred to an air fluidised bed for easier nursing care.⁴ He became suddenly hypotensive. In the absence of visible blood loss this was interpreted as hypovolaemia due to sepsis and was treated as such unsuccessfully. After his death large amounts of blood were found in the bed.

Discussion

The air fluidised bed is an invaluable aid to managing patients. Its use decreases mortality in certain patients.⁵

Recognised complications of using the bed include excessive drying of wounds, increased evaporative loss of fluid, and confusion due to sensory deprivation.⁵ Occult blood loss into the bed had not been reported before.

The standard woven sheet cover has interstices of around 37 µm and is permeable to fluids. Burns units have found it necessary to change the silicon beads frequently.⁶ According to the manufacturers, altered blood is commonly found in the bottom of the beds at servicing. A latex sheet is available, which protects the beads from fluid and silver compounds used in burns care and decreases evaporative loss and drying of wounds. This sheet is recommended as an option by the manufacturers but was not used for these patients.

Both patients had large areas of their body covered with absorbent dressings. As blood leaked into the bed the dressings did not become obviously saturated and no free blood was observed on the bed's surface. Failure to appreciate that haemorrhage was occurring led to inadequate treatment in both cases.

Users of air fluidised beds should be aware that large volumes of blood may be lost into the bed cavity with minimal or no signs of blood accumulating on dressings or on the surface of the bed. Use of a latex sheet should be mandatory for patients at risk. Also, frequent measurements of haemoglobin concentration and packed cell volume are necessary, combined with increased vigilance. This should permit continued safe use of the bed, which has undoubted nursing advantages.⁴

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(Accepted 17 April 1990)

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Br Med J 1990;301:432