A fish induced pneumothorax: dilemmas in the remote management of a sucking chest wound

David Berger

The call came, as such calls always do, at dinner time. It was Jenasi, the very capable nurse from Seghe clinic in Marovo Lagoon, on the radio. A man had just been brought in, having been attacked by a barracuda earlier in the day. He had a large gash in his chest, through which air was passing in and out as he breathed, but his observations were stable and he was not cyanosed. Hmmm.

The sun had just set, which in the Solomon Islands means no evacuation, by air or otherwise, until first light. Should the wound be packed to stop the movement of air or not? We conducted a straw poll among the doctors: our ex-army officer said it definitely should be, as otherwise he was in danger of developing paradoxical breathing; our general practitioner surgeon said probably not; and the Swiss orthopaedic surgeon in the capital, who we contacted by phone, said definitely not as there was no possibility of putting a drain in should he develop a tension pneumothorax and he was currently well. (My own contribution was only to man the radio and whine lamely that such matters did not really form part of a physician's training.)

In the end it was decided to advise the nurse to leave the wound open and give some intramuscular antibiotics, while I flew down the next morning, equipped to put in a chest drain (or at least a recycled suprapubic catheter, which was all we'd been able to rustle up). Very kindly the pilot agreed to hold the flight for 30 minutes and I was rushed over to the clinic by canoe.

Giving instructions over the radio, in Pidgin, is a haphazard affair at the best of times, and I was thus only mildly surprised to find that the wound was swathed in cotton wool and bandages. However, there was no movement of air and the patient looked very well, clinically having only a small axillary pneumothorax.

Now I had a problem: he had remained well for over 18 hours with no active intervention on my part, and I was faced with two possible ways to render him unwell.

The patient (in towel) and his wife in the canoe at the lagoon entrance

I could try to drain his pneumothorax, thus making him safe to fly, but possibly doing him some mischief in the process; or I could fly him out as low as possible, risking the possibility of a "functional" tension pneumothorax as the air in his pleural cavity expanded with increasing altitude.

The minutes were ticking by rapidly, and I was sweating more than even the 35°C heat warranted. What eventually made up my mind was the swell: as we flew down I had observed from the aircraft that for the first time in weeks the swell had moderated and a canoe trip the 60 odd miles to the mission hospital up the coast was a possibility. I consulted the nurse, who agreed that it could be done and so I sent word to the pilot to continue his flight to the capital without us.

A canoe was duly readied and we spent the next five hours battling against a sea which was, needless to say, much bigger than it had appeared from the aeroplane. When we finally arrived an x ray revealed the pneumothorax to be as suspected, and we inspected and photographed the wound, which had what looked like a piece of lung protruding into it, after which we dressed and covered it and put the patient to bed (he was still refusing anything for pain, as he had been since his arrival at the clinic the day before). The next day he had a little difficulty in breathing, and the pneumothorax was somewhat larger but a decision was made not to drain it unless he worsened, and over the next few days he made a rapid recovery, the wound being closed by the excellent New Zealand mission doctor on the sixth day after the attack.

Questions posed by this case are:

- (1) What advice should have been given to the nurse over the radio?
 - (a) Leave it open
 - (b) Pack it

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Open chest wound caused by a flying barracuda

- (c) Leave it open and pack it if he deteriorates
- (d) Pack it and uncover it if he deteriorates
- (e) None of the above
- (2) Would it have been safe to fly him out and, if so, up to what altitude?
- (3) How stupid was it to leave his wound uncovered for a protracted period in the hospital while we sauntered off and fetched our cameras, thus contributing to an increase in the size of his pneumothorax?
- (a) A little
- (b) Moderately
- (c) Extremely

Answers to the editor on a postcard please....

Footnote

The man was actually attacked by a barracuda which jumped out of the water and hit him in the chest while he was standing waist deep in the lagoon in broad daylight, an occurrence which the locals agreed was practically unique. However, pneumothoraces due to fish are not uncommon, and the mission doctor had seen several in his four years in the Solomons. The islanders like to go fishing at night in dugout canoes using torches. These attract fish known as garfish (or long toms), which fly out of the water, sometimes impaling their long, sharp proboscis in the unfortunate fisherman's chest. On one occasion one had penetrated a fisherman's orbit and he died shortly after reaching the hospital.

Manhandling the canoe across rocks in the lagoon passage

I would like to thank Assistant Nursing Officer Jenasi Chedi of Seghe Clinic for general Solomon Islands unflappability. I would also like to thank Dr Roger Brown and family of Helena Goldie Hospital, Munda, for such warm hospitality and the most terrifying motorcycle trip of my life.

Commentary: A conservative management plan from a place where barracuda are rare

John Rees

The general availability of chest x ray examinations has prompted some clinicians to diminish the importance of physical examination of the chest. Faced with a barracuda wound to the chest in a remote part of the Solomon Islands there is nothing else to fall back on, and percussion, tactile vocal fremitus, and breath sounds resume their true importance. Dr Berger had to advise at the end of a telephone line before managing to reach the patient. It was then that the main dilemma arose: was it to be the canoe or the aeroplane?

The canoe was chosen for the 60 mile journey, but I am sure that was the wrong choice. Five hours in rough seas in a canoe are not the usual treatment for pneumothorax. If something had gone wrong it would have been much more difficult to deal with it in a canoe

than an aeroplane and the travel time would have been much longer. Therefore, the justification for the canoe must be the risk of complications during an aeroplane flight.

Commercial passenger aircraft are pressurised to around 2200 to 2500 metres. Atmospheric pressure halves by 5500 metres. At 2500 metres, air in an expandable space will increase in size by around 35%. This might cause respiratory problems or a fall in cardiac output with a large pneumothorax but is unlikely to have much effect with a small pneumothorax. Potential problems come from cysts or bullae which have poor communication links with the lung and which might rupture with the pressure change across the wall. Even then most such air spaces have time constants which allow equilibration during the time of an aircraft's ascent. In this case flight would have been in a light aircraft over the sea and could have been at 1000 feet or so, where there would not have been a significant change in pressure. The best plan would have been an aeroplane transfer at low altitude, with a cannula, syringe, and three way tap at the ready to deal with any deterioration.

When the pneumothorax was a little bigger and he was short of breath initial treatment could have been aspiration rather than insertion of a chest drain.¹ This would have been the equipment to use in the first place at the Seghe clinic rather than consider putting in a drain blindly without an x ray examination.

This case illustrates the ingenuity needed to practise medicine in isolated areas. A less exciting management plan might have achieved the same successful outcome more safely, but this comment is written from London, where the numbers of barracuda wounds and canoe evacuations are not high.

1 Miller AC, Harvey JE. Guidelines for the management of spontaneous pneumothorax. *BMJ* 1993;307:114-6.

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