Penetrating nail gun injury to the head

Clinical History:

A 39-year-old man was admitted following deliberate self harm with a nail gun. The patient had fired 4 nails into his head. The patient was found collapsed by his father. On arrival at the local emergency department the patient had a Glasgow Coma Scale (GCS) of 8 and was agitated. Plain radiography of the skull revealed the nails had penetrated the cranium (Fig 1A, 1B). An un-enhanced computed tomography (CT) of brain identified the intracranial nails, 3 of which were embedded in the right temporal region and 1 in the left temporal region. There was evidence of subarachnoid blood but no evidence of cerebral oedema. (Fig 2A, 2B, 2C) The patient was intubated and ventilated prior to transfer to the regional neurosurgical centre where he underwent urgent bilateral craniotomy and removal of the intracranial foreign bodies. The left middle cerebral artery was clipped. Post operative there were no major complications although the GCS remained low at 11/15 and a dense right hemiparesis became obvious. A repeat CT brain day 1 post-operative revealed intra-cerebral haematomas in the basal ganglia region and posterior right frontal lobe and blood in the sub-arachnoid space and right lateral ventricle (Fig 3A, 3B). A CT brain day 35 post surgery confirmed infarction in the distribution of the left middle cerebral artery (Fig 4). The patient continues to require intensive stroke rehabilitaion and the likelihood of permanent disability remains great.

Discussion:

Penetrating trauma to the head caused by a nail fired from a nail gun is an uncommon and usually non-fatal injury. The growing popularity of these tools has resulted in an increased incidence of nail gun injuries, which are occasionally intentional but usually accidental. In most cases the patient will not have sustained a significant amount of tissue injury. However, as in this case, there can be significant trauma caused by a nail gun. Trauma to the cerebrovascular system can cause injuries such as arterial or venous rupture or thrombosis, arterial dissection and pseudoaneurysm formation. Computed tomography and selective angiography can play a vital role in assessing the patient for any intra or extra cerebral injuries. In this case angiography was not performed as there was evidence of acute haemorrhage on the CT scan and neurosurgery could not be delayed.

Differential Diagnosis List: Penetrating nail gun injury to the head following deliberate self-harm

Final Diagnosis: Penetrating nail gun injury to the head following deliberate self-harm
References:


Shandera W.X., Hayman A. Nail injuries to the skull NEJM 2001; 345:339. Images in clinical medicine.
Figure 1

Description: Origin:
Figure 2

Description: Origin:
Figure 3 a

Description: Origin:
Figure 4

Description: Origin: