



Superficial Temporal Artery Pseudoaneurysm: A Report of Two Ruptured Cases and Review of Literature.

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Superficial temporal artery (STA) pseudoaneurysms are rare cause of scalp swellings and majority are due to trauma. Diagnosis is mainly clinical and the treatment of choice is surgery. Haemorrhage is a rare complication of untreated cases. We report two bleeding superficial temporal artery pseudoaneurysms managed in our centre. They presented with actively bleeding scalp swellings, one in the parietal region and the other in the temple. Diagnosis of superficial temporal artery pseudoaneurysm was made clinically in both cases. Xylocaine with Adrenaline infiltration around the afferent and efferent vessels stopped the bleeding. The patients had coagulation of afferent and efferent vessels and excision of the pseudoaneurysms with good outcome. We also reviewed literature on pseudoaneurysms of the superficial temporal artery.

Key words: Bleeding, Pseudoaneurysm, Superficial temporal artery, Surgery.

Introduction

The first case of superficial temporal artery aneurysm was reported by Thomas Bartholin in 1740¹ and since then over 400 cases have been reported in the literature². Greater than 75% are from trauma³. Temporal arteriotomy for treatment of cerebral congestion, meningitis and apoplexy were reported causes in 19th century⁴. Among current causes are road traffic accidents⁵, falls⁶, sports injuries^{7,8,9}, external ventricular drainage¹⁰, pin-type head holder¹¹ and craniotomy⁷. Bleeding is a rare complication of this lesion¹². We present two patients who presented with bleeding from ruptured superficial temporal artery pseudoaneurysms.

Case 1

A 28 year old man presented in the Accident and Emergency unit of our hospital on 4/11/12 with bleeding from scalp swelling of four hour duration. Five weeks prior to presentation he was attacked by armed robbers in the night. He was hit on the head with a bottle leading to profuse bleeding from the wound he sustained. There was associated scalp swelling. He went to a nearby General hospital where he was treated. The swelling subsided and the wound healed. About two weeks later, small swelling re-appeared at the site and gradually increased in size. On 4/11/12, he felt a cockroach crawling in the area and he hit it with his hand, and what followed was torrential bleeding. He applied pressure over it and came to our accident and emergency unit where pressure dressing with gauze and crepe bandage was applied, and intravenous normal saline infusion commenced for him. Neurosurgical team was invited to review him. There was no history of fever, headache or visual disturbances. He was not a known hypertensive and there was no history of bleeding disorder.

On examination, he was conscious but anxious. He had crepe bandage on the head with the part covering left temporoparietal area soaked by blood. He was afebrile and not pale. His pulse (80b/m) and blood pressure (120/80mmHg) were normal. On removal of the scalp dressing, a jet of blood shoot out from 0.5cm wound over 3cmx3cm swelling on the left temporoparietal area. A linear 3cm scar was noted on the swelling. Using a thick wad of gauze, pressure was applied to stop the bleeding. Digital pressure was then applied on the ipsilateral superficial temporal artery in front of the tragus of the ear. The gauze pressure was released. The bleeding pressure reduced to slight oozing. Diagnosis

of a ruptured pseudoaneurysm of the posterior branch of superficial temporal artery was made. Pressure dressing was applied and patient immediately taken to theatre for surgery.

In the theatre, 1% Xylocaine with adrenaline (1 in 200,000) was infiltrated around the afferent and efferent vessels 1cm from the swelling. The bleeding stopped and clinical photographs taken (Figure 1). Under general anaesthesia, the head was shaved and prepped. Incision was made along the old scar. The afferent and efferent vessels were dissected, coagulated and transected. The sac was incised to rule out arteriovenous fistula (Figure 2). The sac was dissected from the surrounding tissues, including a rim of thinned out skin around the ulcerated area. The wound was closed. He did well and was discharged home on the third post-operative day. He had no symptoms on his last follow up visit, four months after the surgery.



Figure 1. The Ruptured Pseudoaneurysm in Case 1.



Figure 2. Intra-operative Picture of the Pseudoaneurysm Incised to Rule out Arterio-venous Fistula in Case 1..

Case 2

A 15 year old student presented in the Accident and Emergency unit of our hospital on 15/11/12 with history of bleeding from scalp swelling of one hour duration. Three weeks prior to presentation, he was knocked into a gutter by tricycle and he hit his head against the wall of the gutter. He sustained bruises with swelling on the right temple. He was taken to patent medicine dealer who dressed the bruises and gave him some drugs. At home the swelling was massaged with warm water for days. The bruises healed but the swelling only reduced in size. A week prior to presentation, the swelling suddenly started bleeding. Methylated spirit soaked gauze was applied for three hours to stop the bleeding at home. It was observed that the swelling had increased in size and there was an ulcer over it. He was given Ampicillin/cloxacillin capsule (500mg 6 hourly) and Paracetamol tablet (1gm 8 hourly) for five days. One hour prior to presentation, the swelling started bleeding again. Pressure dressing was applied and patient was brought to our accident and emergency unit. There was no history of fever, headache, or visual disturbances. He does not have bleeding disorder.



Figure 3. The Ruptured Pseudoaneurysm in the Second Patient



Figure 4. The Dissected Pseudoaneurysm in the Second Case

On examination, he was conscious but anxious. He had a wound dressing on the right temple which was soaked by blood. He was pale (Packed Cell Volume 28%) but afebrile. On removal of the dressing on the head, a jet of blood shot out from an ulcer of 1cm diameter over swelling of 6cm x 4cm on the right frontotemporal area with scars in different directions. Gauze pressure was applied to stop the bleeding. Digital pressure was applied on ipsilateral superficial temporal artery in front of the tragus of the ear. The gauze was released and the bleeding reduced to slight oozing. Diagnosis of ruptured pseudoaneurysm of the anterior branch of superficial temporal artery was made.

He was taken to theatre for surgery. In theatre, 1% Xylocaine with Adrenaline (1 in 200,000) was infiltrated around the afferent and efferent vessels 1cm from the swelling. The bleeding stopped and photograph taken (Figure 3). Under general anaesthesia, incision was made along the longest scar and extended. The afferent and efferent vessels were dissected out, coagulated and transected. The sac was dissected with a rim of stretched out skin around the ulcer (Figure 4). The wound was closed. He was discharged home on the third postoperative day. He did not come for follow up. We called the uncle on 14/1/13 to enquire about his condition. He said he had been alright since the surgery.

Discussion

Superficial temporal artery pseudoaneurysm is a rare clinical entity. Since it was first reported by Bartholin¹ in 1740, about 400 cases have been reported in literature¹³. Many centres reported one case^{12,14,15,16,17,18} while few centres reported two cases^{19,20}. Report of 6 cases over 18 year period is seen in literature²¹. Although the authors that reported two cases did not state the periods, the two cases we presented were seen over a two and half year period. Over 75% of cases are from blunt trauma^{22,23,24,25,26,27}. The two cases we presented are from blunt trauma. The first case was hit on the head with a bottle while the second case was knocked into a concrete gutter and his head hit the wall. Majority of cases are found in males^{14,21,28}. The two cases we presented are males. This may be due to males being more adventurous than females.

The anatomical position of superficial temporal artery makes it vulnerable to trauma. The artery is separated from the cranium by temporalis muscle which serves as cushion. This muscle lacks the bulk to prevent injury from strong force²¹. The anterior branch is made more vulnerable when it leaves temporalis muscle to enter frontalis muscle. Here it lies directly on pericranium and its adventitia tether it to temporalis fascia and fascia over frontalis muscle preventing its lateral displacement in tangential forces.^{21,29} Moreover, the prominence of superior temporal line anteriorly where this branch crosses makes it even more susceptible to trauma.³⁰ Thus the anterior branch is commonest site of pseudoaneurysm.^{14,21,31} The second case was in this location of the anterior branch, while the first case was in parietal branch where the impact from the bottle caused laceration of the scalp.

Pseudoaneurysm is formed when there is laceration or necrosis of arterial wall leading to bleeding into subcutaneous tissues²¹. There is formation of pseudocapsule around the resultant haematoma. As the haematoma resolves, a cavity is created which communicates with the arterial lumen. Arterial pressure causes the wall to dilate^{7,32,33} and dilatation depends on strength of tissues around the pseudocapsule. Erosion of skin can occur leading to haemorrhage^{12,15,34,35,36}. It could also rupture into subgaleal space leading to subgaleal haematoma.³⁴ The two patients we presented bled from skin erosion and rupture.

Majority of patients present 2-6 weeks after trauma to the head^{12,14,19,22,23,31,34}. The first patient presented 5 weeks after the trauma, while the second presented 3 weeks after the injury. Symptoms include swelling at trauma site that is increasing in size, which may be pulsatile and may be associated with headache^{13,16,19,21,19,20}. The first patient felt crawling sensation in the area which might have been the pulsation of the mass or blood tracking down after rupture. Rupture through the skin with haemorrhage^{15,35,36} or into the subgaleal space with subgaleal haematoma³⁴ are uncommon



clinical presentations. The pseudoaneurysms in our patients ruptured through the skin. The first patient presented during first bleeding while the second patient presented during second bleeding.

Differentials of this lesion include simple haematoma, lipoma, angiofibroma, cyst, abscess, encephalocele, aneurysm of middle meningeal artery^{5, 10, 37, 38}.

Many investigations have been done to diagnose the lesion. These include Computerised Tomography (CT) scan with contrast³⁹, CT angiography^{13,16,31}, Carotid angiography^{12,34}, Duplex ultrasound⁴⁰, Digital subtraction angiography (DSA)¹⁷. DSA is associated with complications⁴¹. Many authors believe that superficial temporal artery pseudoaneurysm should be diagnosed clinically from history and physical examinations^{8,21,34}. The two patients we presented were diagnosed clinically. In our environment where resources are limited and some of these investigative modalities are not available, it will be unnecessary to wait for these investigations especially when patients present in emergency conditions like the two cases we managed.

Many modalities of the treatment have been advocated. Conservative approach with intermittent compression had been used but this has not been effective¹³. Thrombin injections with resultant thrombosis have been used,^{15,18,42,43} but it has associated complications⁴⁴. Ultrasound-guided percutaneous embolisation has been done,³⁷ but has complications⁴⁴. The gold standard is surgical resection^{13,18,22,21,23,29,31,34}. Indications for surgery are cosmesis and to avoid haemorrhage. In our patients, surgical resections were carried out due to haemorrhage.

Conclusion

Superficial temporal artery pseudoaneurysm is rare and trauma is the principal aetiology. It should be diagnosed clinically from the history and physical examination and if in doubt CT angiography can be done. Surgery should be done as soon as possible to avoid rupture and haemorrhage. In bleeding cases, Xylocaine with Adrenaline infiltration around the afferent and efferent vessels will stop bleeding and reduce blood loss prior to surgery. Coagulation of the vessels with diathermy will ensure effective obliteration of the vessels unlike ligation in which sutures can slip and lead to recurrence.

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