CASE REPORT

A Rare Case Giant Infected Aneurysm in a 51-Year-Old Woman with History of Left Ear Pain, Facial Drooping, and Ear Surgery Revealed by Computed Tomography

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ABSTRACT

Infected aneurysms, though rare, present significant challenges in contemporary medical practice. Coined by Sir William Osler in 1885, the term "mycotic aneurysm" encompasses infections of native arteries and preexisting aneurysms, posing life-threatening risks of arterial rupture and recurrence. We discuss a case involving a 51-year-old woman with a giant infected aneurysm, highlighting the complexities in diagnosis. The patient presented with bleeding from her left ear, a fluctuating neck mass, and decreased hearing. Contrast-enhanced computed tomography (CT) played a crucial role in revealing the infected giant aneurysm in the left internal carotid artery, associated with arteriovenous malformation and fistula. Additionally, incidental findings included aneurysms in the right internal carotid and bilateral vertebral arteries. The case underscores the importance of a high index of suspicion and advanced diagnostic tools for timely and accurate diagnosis. The rarity of experienced centers in managing such cases, coupled with a lack of consensus in diagnostic criteria, poses challenges for treatment improvements. *Malaysian Journal of Medicine and Health Sciences* (2024) 20(4): 392-395. doi:10.47836/mjmhs20.4.48

Keywords: Mycotic Aneurysm, Infected Aneurysm, CT Scan, Arteriovenous Malformation, Vascular Disease Treatment

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INTRODUCTION

Infected aneurysms, although rare, present substantial challenges within contemporary medical practice despite advancements in vascular disease treatments. Coined by Sir William Osler in 1885, the term "mycotic aneurysm" has evolved to encompass primary infections affecting both native arteries and preexisting aneurysms. These life-threatening conditions, characterized by an elevated risk of arterial rupture and recurrence, necessitate a nuanced understanding of their etiology. Factors such as bacterial invasion, particularly prevalent in immune-compromised patients, contribute to the complexity of diagnosis. Changes in causative organisms over time, the increasing incidence of trauma-related infected pseudoaneurysms, and geographical variations in infecting organisms further complicate the landscape. Accurate and timely diagnoses are essential, underscoring the need for a high index of suspicion and advanced diagnostic tools like contrast-enhanced computed tomography (CT), which can reveal crucial details such as saccular or multilocular appearances of aneurysmal sacs and identify periaortic infection foci. These intricacies contribute to the rarity of experienced centers in managing such cases, coupled with a lack of consensus in diagnostic criteria, making improvements in treatment challenging [1,2]. We present a case of a 51-year-old woman with a giant infected aneurysm and discuss the CT-scan result.

CASE REPORT

A 51-year-old woman came with complaints of bleeding from her left ear one month after being admitted to the hospital. The patient complained of pain in the left ear, abdominal face, fluctuating mass in the left neck accompanied by blood flow noises, and decreased hearing. The patient denies any complaints of dizziness or ringing in the ears. The patient reported a history of left ear surgery in 2017. The patient has regular check-ups at the neurologist clinic and receives antibiotic therapy. But the complaints did not decrease and the lump was felt to be getting bigger.

A local status examination of the left ear showed a mass that filled the CAE with active bleeding emerging from the mass. The mass in the left CAE obstructs imaging of the tympanic membrane as well as light reflex impressions in the left ear. In contrast to the findings in the localized status of the right ear showed no abnormalities impression. There are no pathological abnormalities found on examination of the nose and throat. The examination of the local status of the throat revealed a uvula in the middle with a normal T1/T1 tonsillar impression. In the Colli region, there was no enlargement of the lymph nodes, but a fluctuating mass measuring 10 cm x 10 cm x 5 cm was found, without tenderness, and accompanied by blood flow bruits.

Based on the angiography examination carried out (Figure 1), the main finding was an infected giant aneurysm in the left internal carotid artery in the C1 – C6 segment with a size of 16.7x4.7cm which was associated with an arteriovenous malformation and an arteriovenous fistula with a feeding artery originating from the left internal carotid artery with draining veins into the left jugular vein, left cavernous sinus, left sigmoid sinus, and superficial veins (left superior and inferior petrosal sinuses, occipital sinus, and left temporal cerebral sinus). These findings were accompanied by ectasia of the left internal jugular vein and superior vena cava which caused destruction of the pars squamous, pars mastoid, pars petrosus et os styloideus, os left temporalis, clivus, tuberculum sella, os occipitalis left and compression of the fourth ventricle with severe congestion (AVF classification based on Borden III and Cognard IV). Meanwhile, an incidental finding from the angiography examination was the discovery of an aneurysm structure of the right internal carotid and bilateral vertebral arteries. Angiographic imaging also showed the impression of non-communicating hydrocephalus with a level of obstruction as high as the aqueduct sylvii, the impression of encephalomalacia in the left occipital lobe and left cerebellum, and chronic right maxillary sinusitis.

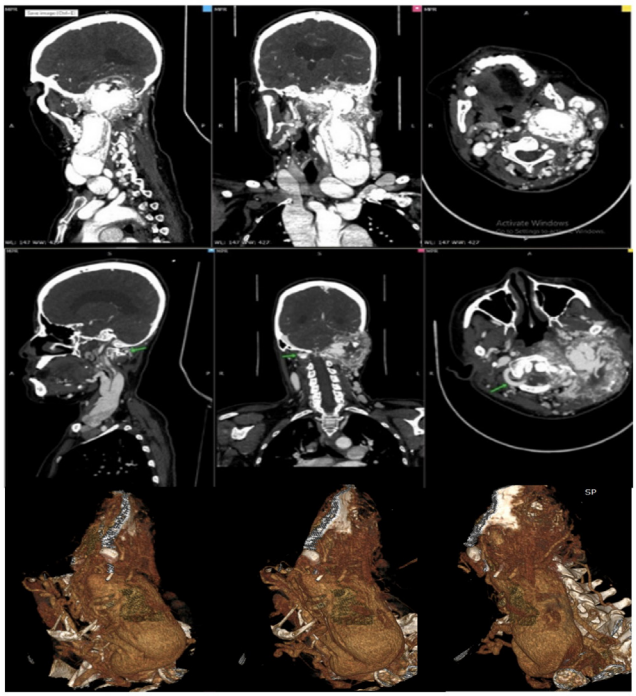

Figure 1: CT Scan from a 51-year-old woman came with complaints of bleeding from her left ear. CT Scan result reveal an Infected Giant Aneurysm in the left internal carotid artery in segments C1 to C6 with a length of 16.7 cm and a greatest width of 4.7 cm which is associated with an AVM / AVF with a feeding artery originating from the left inteinternal carotid artery with a draining vein to the left jugular vein, left cavernous sinus, left sigmoid sinus and superficial vein. An incidental finding was obtained in the form of an aneurysm of the right internal carotid artery and bilateral vertebral arteries

DISCUSSION

Infected aneurysm is a diagnosis that developed from the name "mycotic aneurysm" which was first discovered by Sir William Osler in a case of endocarditis which caused complications extending to the ascending aorta in the form of infected aneurysm. The name infected aneurysm diagnosis then developed to include generally the infectious pathological conditions in aneurysms caused by bacterial or fungal causes. Infected aneurysm is a rare case with coverage only ranging from 1 – 2.6% of total aneurysm cases [1–3].

Based on the source of infection, infected aneurysm causes can be classified into primary and secondary etiology. Primary infected aneurysm is an infective condition caused by an infection or trauma directly at the point of the aneurysm via intravascular or extravascular route or spread via lymphatic vessels. Meanwhile, secondary infected aneurysm arises from the septic embolization process of previously formed atherosclerotic plaque. These emboli can trigger the process of organism colonization of the blood vessel walls and stimulate the local suppuration process which has implications for weakening of the arterial walls involved [3–5].

The pathological cause of an infected aneurysm can be caused by bacterial or fungal organisms. Bacteria that can cause infected aneurysms include Salmonella sp., Escherichia coli, Streptococcus viridans and Streptococcus faecalis, Staphylococcus aureus, and Staphylococcus epidermidis, Haemophilus, Pseudomonas, and Pneumococcus. Meanwhile, the causes of infection from fungal organisms include Histoblastoma capsulatum, Candida, and Aspergillus [2].igu

Infected aneurysm can affect almost all arterial structures in the human body. However, the predilection areas for infected aneurysm include the femoral artery (56%), abdominal and thoracic aorta (33%), intracranial and extracranial arteries (5%), innominate (2%), iliac arteries (2%), and arteries splanchnic (1%) [2].

An infected aneurysm does not have typical complaints

or symptoms that can specifically describe subjective complaints from the diagnosis of the infected aneurysm. Prominent clinical manifestations of infected aneurysm include local pain, hyperemia, increased temperature, and pulsatile masses in the affected arteries. It is also necessary to obtain information regarding the presence of comorbid disease factors. Comorbid factors that can play a role in the pathogenesis of infected aneurysm include diabetes (33%), chronic renal failure (30%), long-term steroid use (16%), and other chronic diseases (16%) such as malignancy, rheumatoid arthritis, and monoclonal gammopathy [2]. In this case, a diagnosis of infected enaurysma was obtained from the result form Computed tomography angiography, left internal carotid artery in segments C1 to C6 with length 16.7 cm and the largest width is 4.7 cm. The patient's history revealed recurrent infections, and patient reported a history of left ear surgery in 2017.

Laboratory tests that can be carried out to support the diagnosis of an infected aneurysm include routine blood tests with leukocytosis, increased erythrocyte sedimentation rate (ESR), increased C-reactive protein (CRP) levels, and positive blood culture findings. However, these supporting examinations are inconclusive and imaging modalities can be used as the examination modality of choice to help confirm the diagnosis of infected aneurysm [3].

Several imaging modalities can be applied to diagnose infected aneurysms. CT scan imaging can provide an overview of the soft tissue affected by the infected aneurysm. CT scan is the modality of choice due to the availability of a tool that is quite general, easy to apply, and can specifically provide an overview of the shape, size, and pathological features of the surrounding tissue, as well as the presence of calcification of the aneurysm structure [4,5].

Conventional angiography can be performed as an initial imaging modality due to its ability to provide images of aneurysms, lobulation contours, and involvement of vascular branches in the anatomical structure of the affected aorta. MR imaging can also provide an overview of the shape and size of the aneurysm. However, MRI cannot provide an overview of periaortic abnormalities due to infected aneurysms. In addition, nuclear medicine modalities can be used to determine the presence of infective factors in the aneurysm [4,5].

The use of CT angiography (CTA) in the assessment of aortic disease—including MAAs—is increasing, owing to its non-invasive, efficient, broad coverage and its isotropic voxel capabilities. With CT technology development and advanced dose reduction techniques, CTA is a fast and high-quality method with minimal contrast medium and radiation dose. The high tissue resolution of MRI can provide valuable anatomical and physiological information, especially in assessing abscess and tissue edema. In the latest studies, 18F-FDG-PET/CT has shown higher sensitivity and diagnostic accuracy in infected aortic aneurysms and aortic prosthetic graft infection compared to CTA. Ultrasound examination produces superior CT-like images and appears to be useful for the noninvasive diagnosis of infected AAA, although further prospective examination should be done to demonstrate its sensitivity and specificity. This patient did not have an ultrasound examination before the Computed Tomography angiography [4,5].

8F-fluorodeoxyglucose (FDG) positron emission tomography (PET)/CT can detect infected aneurysms in clinically suspicious cases. FDG PET/CT is useful in noninfectious aortitis involving medium, small, and large blood vessels. It helps in diagnosis, differential diagnosis, ruling out other causes of aortitis, and identifying target locations for biopsy. In addition, it is useful for evaluating the extent and activity of the disease, predicting prognosis, monitoring response to therapy, and evaluating the effectiveness of therapy [4,5].

The principles of infected aneurysm management consist of administering antibiotics and operative action. EVAR, or endovascular aneurysm repair is an operative modality that can be performed in aneurysm cases by considering the patient's hemodynamic stability. EVAR is known to have good short-term survivability rates, without causing many complications when compared to the open surgical repair (OSR) method. In patients with a stable hemodynamic condition, surgery can be postponed to maximize the potential use of antibiotics. However, patients with unstable hemodynamics should immediately undergo EVAR surgery without considering the use of antibiotics beforehand [2].

CONCLUSION

In conclusion, this case revealed that severely displaced fracture in osteopetrotic bone managed by ORIF gave good and satisfactory results. While open reduction and internal fixation prove to be effective treatments for osteopetrosis fractures, the unique characteristics of osteopetrotic bone necessitate careful consideration of technical challenges, potential complications, and the choice of fixation methods. Surgical interventions, when performed with specific strategies, can lead to successful outcomes in fracture healing in osteopetrosis patients. Increased awareness of diagnostic clues, such as minor trauma history and elevated bone density in radiography, is crucial for accurate diagnosis in patients with fractures related to osteopetrosis.

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In conclusion, infected aneurysm presents a diagnostic challenge due to its rare occurrence and non-specific

symptoms. While routine investigations may yield inconclusive results, our case highlights the pivotal role of imaging modalities, particularly CT scans, in achieving a precise diagnosis. Recognizing the complexities in managing infected aneurysms underscores the importance of ongoing research and a multidisciplinary approach. Addressing these challenges will not only improve patient outcomes but also contribute to the broader understanding of this uncommon yet critical condition

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