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Enlargement of preexisting superficial temporal artery pseudo-aneurysm co-incidental to mask wearing during the Covid-19 pandemic

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ABSTRACT

The superficial temporal artery (STA) pseudo-aneurysm is usually associated with trauma. We report a unique case of an STA pseudo-aneurysm that developed due to mask wearing during the Covid-19 pandemic. A 70-year-old female presented with a 3-month history of a rapidly growing pseudo-aneurysm of the right STA. Over the past 3 months the patient had been wearing a mask for the prevention of Covid-19. The STA aneurysm was located exactly at a pressure point created by the rubber mask. Therefore, we assumed that an enlargement of the preexisting aneurysm had taken pace due to irritation from the elastic band of the mask. Surgical excision of the aneurysm and reconstruction of the STA using STA-STA bypass were performed. To our knowledge, we here report the first case of an STA pseudo-aneurysm that was potentially affected indirectly by the Covid-19 pandemic. Clinicians should be cautious about the preexisting medical condition that is potentially worsened by mask band compression.

1. Introduction

Coronavirus Disease 2019 (Covid-19) is a new pathogenic agent that was first described in Wuhan, China. It has since rapidly spread worldwide and the World Health Organization declared Covid-19 a global pandemic as of March 11, 2020. We were forced to mask wearing to prevent Covid-19 infection.

Superficial temporal artery (STA) pseudo-aneurysms are rare occurrences, with several hundred cases reported in the literature. In this report, a 70-year-old female presented with a pseudo-aneurysm of the STA, which developed due to mask wearing during the Covid-19 pandemic. Surgical excision of the aneurysm and reconstruction of the STA using STA-STA bypass were performed. To our knowledge, we here report the first case of an STA pseudo-aneurysm that was affected indirectly by the Covid-19 pandemic.

2. Case report

Fifteen years previously, a 70-year-old female had undergone a craniotomy and neck clipping for rupture of a left middle cerebral artery aneurysm. At the same time, an aneurysm arising from the right STA was also noted. Following surgery and recovery, she was discharged with no neurological deficit and underwent follow-up computed tomographic angiography once a year thereafter. The STA aneurysm progressed without an increase in size over the intervening fifteen years.

Recently, however, the patient was admitted to our hospital with a 3-month history of a growing, painful and pulsatile mass on the right temple. A three-dimensional computed tomographic angiography showed a 25 × 20 mm sized aneurysm arising from the main trunk of the STA (Fig. 1-A). There was no history of head trauma. Over the past 3 months the patient had been wearing a mask for the prevention of Covid-19. The STA aneurysm was located exactly at a pressure point created by the elastic band of the mask (Fig. 2). Therefore, we assumed that an enlargement of the preexisting aneurysm had taken pace due to irritation from the wearing of the mask. The patient underwent surgery under general anesthesia. The lesion was incised with the patient in a decubitus position; the incision covered the length of the aneurysm from proximal to distal of the STA; a measurement of approximately 30 mm. Surgical extirpation was performed by ligating the proximal and distal ends of the STA. Subsequently, we performed reconstruction of the STA by end-to-end anastomosis using STA stumps (STA-STA bypass; Fig. 3-A, B). The wound was carefully sutured for an optimal cosmetic outcome.

Abbreviations: Covid-19, Coronavirus Disease 2019; STA, superficial temporal artery.

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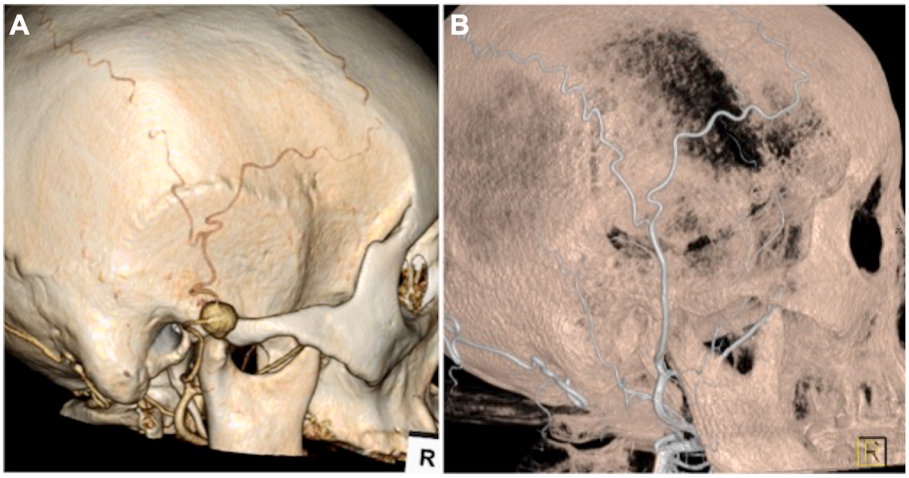

Fig. 1. A three-dimensional computed tomographic angiography showing the aneurysm in the main trunk of the right STA (A), and the postoperative normalized blood flow (B).

Fig. 2. The STA aneurysm was compressed by the elastic band of the mask (arrow head).

Histopathological examination showed a pseudo-aneurysm without intima or internal elastic membrane. Postoperative three-dimensional computed tomographic angiography confirmed the removal of the aneurysm and the patency of the STA-STA bypass (Fig. 1-B). No recurrence was observed, showing a good postoperative course, the patient was discharged on the 7th postoperative day. The Histopathological study showed the disruption of internal elastic membrane without lymphocytic infiltration, and confirmed the diagnosis of pseudoaneurysm (Fig. 3-C).

3. Discussion

STA pseudo-aneurysms are uncommon and are usually associated with traumatic etiologies. For example, they can be caused by injections of botulinum toxin and craniotomy [1,2]. Also, a connective tissue disease such as subcutaneous angiolymphoid hyperplasia with eosinophilia has been reportedly associated with the pseudo-aneurysmal formation, and coagulopathy may also increase the risk of development [2]. In this case, the original pseudo-aneurysm formation may be due to craniotomy performed 15 years ago, however, it should be noted that the size had been unchanged until the Covid-19 pandemic. Since there were neither histories of connective tissue diseases nor coagulopathy, we suspected the possibility that the fragile aneurysmal wall was further injured by the elastic band of the mask. As shown in Fig. 2, the elastic band compressed the distal portion of the pseudo-aneurysm, and stretched the wall. This may have resulted in the microbleeds in the wall and remodeling of the pseudo-aneurysm. Therefore, we considered that the STA pseudo-aneurysm was affected indirectly by the Covid-19 pandemic, however, this phenomenon may be co-incidental as there is no definitive evidence of our hypothesis.

These lesions present as a pulsating mass and sometimes their size may rapidly increase. A pulsating mass that is easily compressed with digital pressure is a very discriminating feature [3]. STA pseudo-aneurysms may also be associated with headache, ear discomfort, and resolution of a cosmetic defect. There have also been reports of pseudo-aneurysm of the STA after bypass procedures involving STA and intracranial vessels. These may rupture with consequent subarachnoid or intracerebral hemorrhage [4]. Therefore, STA pseudo-aneurysms require careful evaluation and a conclusive approach in order to avoid the risk of subsequent mass growth or other complications such as rupture. Although some conservative approaches are used, aneurysm excision is the most highly recommend treatment. Other treatment options are available and include manual compression alone, or endovascular obliteration and embolization; however, surgical removal after ligation of proximal and distal segments of an STA seem to be highly effective [5–7]. There has been no previous report of reconstruction of an STA using STA-STA bypass. In this case, movement of STA made reconstruction possible. Where permitted, it appears that excision of the aneurysm and reconstruction of the STA is the treatment of choice, with a better long-term outcome and fewer complications.

4. Conclusion

This is a unique case of an STA pseudo-aneurysm that occurred following irritation from a mask worn during the Covid-19 pandemic. Clinicians should caution such patients to pay attention for pressure of the mask wearing not to worsen the preexisting condition.

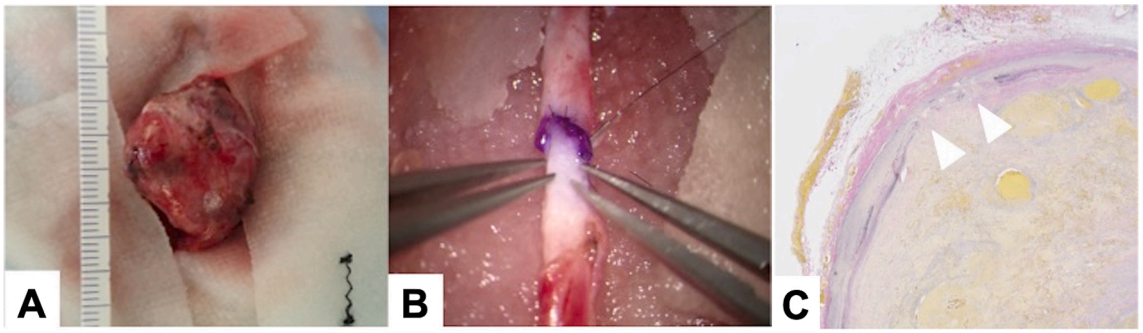

Fig. 3. A) Intraoperative view of the 25 mm diameter aneurysm arising from the STA. B) Reconstruction of the STA by end-to-end anastomosis using STA stumps. C) Histological picture of the pseudo-aneurysm showing the disruption of internal elastic membrane without lymphocytic infiltration.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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