

Our Operative Interventions in Upper Extremity Peripheral Arterial Aneurysms

ÜST EKSTREMİTE PERİFERİK ARTER ANEVİZMALARINDA CERRAHİ TEDAVİ UYGULAMALARIMIZ

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Summary

Objective: Incidence of upper extremity peripheral arterial aneurysms is less than that of lower extremity peripheral arterial aneurysms. They are caused by atherosclerosis, thoracic outlet syndrome or traumas. Those involved are subclavian, axillary, brachial and less frequently hand and wrist arteries.

Material and Methods: Ten peripheral aneurysms in 10 patients whom we operated on between February 1998 and January 2002 in our clinic were assessed retrospectively.

Results: Of those cases, 5 were subclavian, 3 axillary and 2 brachial arterial aneurysms. All these patients were treated surgically with aneurysmectomy and graft interposition, with no mortality or morbidity being observed.

Conclusion: Peripheral arterial aneurysms can lead to such important complications as thromboembolism and loss of extremities. For this reason, their operative treatments should not be delayed any longer.

Key Words: Peripheral arterial aneurysms, Upper extremity, Operative treatment

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Özet

Amaç: Üst ekstremitte periferik arter anevrizmalarının görülme sıklığı, alt ekstremitte periferik arter anevrizmalarından daha azdır. Ateroskleroz, torasik outlet sendromu ya da travma sonucu oluşurlar. Tutulan arterler subklavian, aksiller, brakial ve daha az sıklıkta da el ve bilek arterleridir.

Gereç ve Yöntemler: Şubat 1998–Ocak 2002 tarihleri arasında kliniğimizde opere ettiğimiz 10 olgudaki 10 periferik anevrizma retrospektif olarak değerlendirilmiştir.

Bulgular: Olguların 5'i subklavian, 3'ü aksiller ve 2'si brakial arter anevrizmasıydı. Tüm olgular cerrahi olarak tedavi edilmiş, anevrizmektomi ve greft interpozisyonu yapılmıştır. Hiçbir olguda mortalite ve morbidite gelişmemiştir.

Sonuç: Periferik arter anevrizmaları tromboemboli ve ekstremitte kayıpları gibi önemli komplikasyonlara neden olabilirler. Bu nedenle cerrahi tedavileri geciktirilmemelidir.

Anahtar Kelimeler: Periferik arteriyal anevrizmalar, Üst ekstremitte, Cerrahi tedavi

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Upper extremity peripheral aneurysms are seen less frequently than other peripheral aneurysms. However, it is of great importance to treat and operate on them in that they can result in serious injuries such as loss of fingers and extremities. Particularly, proximal subclavian arterial aneurysms can produce such pathologies as upper extremity thromboembolism likely to cause gangrene, as well as ruptures, neurovascular and sensorial dysfunctions caused by brachial plexus pressure and central neural system disorders due to retrograde thromboembolism.

Upper extremity peripheral arterial aneurysms located more distally, however, can create throm-

boembolic complications in hands and fingers in particular (1). We assessed retrospectively peripheral aneurysms in ten cases who were operated on due to their peripheral arterial aneurysms between February 1998 and January 2002.

Material and Methods

Ten peripheral aneurysms in ten cases operated on in our clinic because of upper extremity peripheral arterial aneurysms between February 1998 and January 2002 were evaluated retrospectively. Nine of the patients were male and one was female. Average age was 61±2 years with a range between 50 to 72 years. Of those patients, (50%)

showed subclavian, 3(30%) axillary and 2(0%) brachial arterial aneurysms (Table 1).

Three cases admitted for asymptomatic supraclavicular mass, one with left supraclavicular mass and weakness and numbness at left hand, one with swelling in left supraclavicular region and ischemic complaints at upper extremity. Two cases admitted to our clinic for asymptomatic axillary mass and one case admitted to chest surgery clinic in another hospital for enlarging axillary mass, since abundant hemorrhage developed during biopsy he was transported to our clinic emergently. In this patient, arterial aneurysm and rupture was determined with emergent upper extremity selective arteriography (Figure 1). Two cases admitted to our clinic with swelling of brachial fossa and ischemic complaints of hand and foot fingers.

Diagnostic tools were, selective upper extremity arteriography and coronary angiography in 10, dynamic computerized tomography in 4, duplex ultrasonography in 5 cases. According to coronary angiography results; percutaneous transluminal angioplasty (PTCA) was performed for left anterior descending artery lesion in one and right coronary artery lesion in two cases. In other 7 cases, medical therapy was suggested for coronary lesion.

All patients were treated surgically (Table 2). A supraclavicular and if necessary infraclavicular incision was performed in all subclavian aneurysms. We performed aneurysmectomy and polytetrafluoroethylene (PTFE) graft interpositioning in 4 and aneurysmectomy and saphen vein graft interpositioning in 1 subclavian artery aneurysms. Infraclavicular and deltopectoral incision was used for axillary artery aneurysm. we performed aneurysmectomy and polytetrafluoroethylene (PTFE) graft interpositioning in 1 case and aneurysmectomy and saphen vein graft interpositioning in 2 cases. Also in 2 brachial artery aneurysms, aneu-

Figure 1.

rysmectomy and saphen vein graft interpositioning was performed.

Results

There was no mortality and loss of ischemic extremities in any cases. Two early postoperative complication occurred. They were embolism of the brachial artery which have been successfully treated by transbrachial embolectomy. One case with a decrease of force in the left arm due to brachial plexus pressure before the surgery tended to reduce such complaints postoperatively and was included in the physical therapy program. Histopathological examinations revealed that three subclavian and one axillary aneurysms were atherosclerotic.

The grafts patency in the early postoperative period were 100%. The cases were then invited to controls periodically. The physical examination and Doppler ultrasonography showed no late complications. Patients were followed-up for a mean period of 1.8 ± 3.5 years. We did not observe any vascular problems. In follow-up period, the grafts patency were 100%.

Table 1. Peripheral arterial aneurysms that we operated in our clinic

	Number of cases	%	Number of aneurysms
Subclavian arterial aneurysms	5	50	5
Axillary arterial aneurysms	3	30	3
Brachial arterial aneurysms	2	20	2
TOTAL	10	100	10

Table 2. Operative data

Aneurysm Localization	Aneurysm Size		Operation
Subclavian artery			
Case 1	6X7 cm	aneurysmectomy+PTFE graft	interpos.
Case 2	6X4 cm	aneurysmectomy+PTFE graft	interpos.
Case 3	5X6 cm	aneurysmectomy+PTFE graft	interpos.
Case 4	6X6 cm	aneurysmectomy+PTFE graft	interpos.
Case 5	5X7 cm	aneurysmectomy+saphenvein	interpos.
Axillary artery			
Case 1	5X5 cm	aneurysmectomy+PTFE graft	interpos.
Case 2	4X6 cm	aneurysmectomy+saphenvein	interpos.
Case 3	5X6 cm	aneurysmectomy+saphenvein	interpos.
Brachial artery			
Case 1	3X5 cm	aneurysmectomy+saphenvein	interpos.
Case 2	3X4 cm	aneurysmectomy+saphenvein	interpos.

PTFE: Polytetrafluoroethylene, interpos: interpositioning

Discussion

Incidence of upper extremity peripheral aneurysms is less than that of lower extremity peripheral aneurysms. Those involved are subclavian, axillary, brachial and less often hand and wrist arteries. Subclavian arterial are not those seen as frequent peripheral arterial aneurysms (2-5). Proximal subclavian arterial aneurysms are often accounted for by atherosclerosis, while distally localized subclavian and subclavian-axillary aneurysms likely to extent to the first section of the axillary artery are often due to the thoracic outlet syndrome. In 50% of the cases with atherosclerotic subclavian arterial aneurysms are seen aorta-iliac and other peripheral arterial aneurysms (6,7). There fore, other accompanying aneurysms should also be investigated in the case series showed that right axillary arterial aneurysm accompanied subclavian arterial aneurysm. All the five subclavian arterial aneurysms were distally and medially localized and three of them were found to be atherosclerotic after the histopathological examination.

Subclavian arterial atherosclerotic aneurysms are either abnormal or can be developed in normal artery and are rare. Crawford et al (8) reported 3, and Hobson et al (6) 4 atherosclerotic subclavian arterial aneurysms in 107 cases with peripheral arterial aneurysms. Although the thoracic outlet syndrome is often the reason for the subclavian arterial aneurysms in the thoracic ascendance, none

of our cases showed findings and indications related to thoracic outlet syndrome. We can encounter these aneurysms thanks to increased life expectancy and sophisticated diagnostic procedures and examinations in recent years. Davidovic et al (2) found that 3 of their 8 subclavian arterial aneurysm cases were atherosclerotic. Proximal subclavian and subclavian and axillary arterial aneurysms without any thrombosed pulsation can well mix with neoplasms. Our two cases with a medially localized subclavian and axillary arterial aneurysms suffered from acute bleedings during their biopsies in another clinic in the thought that they might have developed tumors, and were taken to our clinic urgently. It is well possible to diagnose such aneurysms easily by means of Duplex ultrasonography and selective upper extremity angiograms, and a satisfactory physical examination (peripheral arterial pulse examination).

Sufficient proximal control can be achieved as the result of combination of median sternotomy with right supraclavicular incision for the purpose of operative treatment of proximal right subclavian arterial aneurysms (9). Left thoracotomy is indicated for left proximal subclavian arterial aneurysms. On the other hand, supraclavicular incision is used for the operation on medially and distally localized subclavian arterial aneurysms. This incision can be extended to infraclavicular and deltopectoral region when needed. Occasionally it

might be necessary to incise the middle section of the clavícula (10). We did not perform any clavicular resection. Two cases underwent supraclavicular and three patients supraclavicular and infraclavicular incisions. What is essential for the operation on those aneurysms consists of aneurysmectomy and graft interposition. We performed aneurysmectomy and polytetrafluoroethylene (PTFE) graft interpositioning in 4 and aneurysmectomy and saphen vein graft interpositioning in 1 subclavian artery aneurysms.

Axillary arterial aneurysms are very rare (11,12). Infection, periarteritis nodosa, congenital arterial defects and trauma play a role in the etiologies of axillary arterial aneurysms. Bruised and penetrated trauma is one of the major reasons for the axillary arterial aneurysms (13). Rob was the first to describe the axillary arterial aneurysms caused by bruised trauma in 1956 (14). Succeeding cases were reported by Brooks and Abbot (15). Two cases of ours had histories of bruised traumas. However the aneurysm was found to be of atherosclerotic origin after the histopathological examination in one case. The surgical treatment of axillary and brachial arterial aneurysms consist of aneurysmectomy and graft interposition as well. We performed aneurysmectomy and PTFE graft interpositioning in 1 and safen vein graft interpositioning in 2 axillary artery aneurysms. Trauma play a major role in the etiologie of brachial arterial aneurysms, as well as in that of axillary arterial ones. One of two cases had a history of bruised trauma They remain latent or asymptomatic unless neurological or thromboembolic complications develop (16). We performed aneurysmectomy and safen vein graft interpositioning in 2 brachial artery aneurysms.

In Conclusion, although peripheric arterial aneurysms induce fewer dangers to cases than thorax and abdominal aorta aneurysms, surgical treatments of extremity arterial aneurysms are of importance in that they lead to thromboembolies and ischemic extremities which extend to gangrenes and amputations. For this reason, operative management of such cases should not be further delayed.

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