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RESEARCH ARTICLE / ARAŞTIRMA MAKALESİ

Temporal Artery Biopsy: Review of 36 Patients

Temporal Arter Biopsisi:36 Hastalık Seri

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ABSTRACT

Aim: Temporal arteritis is a systemic vasculitis that affects large and medium sized vessels. Vasculitis signs have to be shown for accurate diagnosis; hence temporal artery biopsy is still the gold standard for diagnosis. In this study, we evaluated the patients in whom temporal artery biopsies were performed.

Material Methods: In between September 2004 and June 2014, we peformed temporal artery biopsy in 36 patients, who had temporal arteritis complaints. Patients were retrospectively evaluated for their clinical properties, performed procedures and their results.

Results: Thirty-six patients were enrolled into study, who were referred to our clinic for temporal artery biopsy. Of these, 11 (30.5%) were male, 25 were female (69.5%) and mean age was 61.1 (range between 56-81) years. Mean erythrocyte sedimentation rate was 56.3 mm/hr (range between 51-130). In our study, 7 (19.4%) patients had concordant findings which were representative of temporal arteritis. As a complication, only one patient had ecchymosis on the right orbital region that lasted in one week.

Conclusion: Different results are published in the literature for positivity rates of temporal artery biopsies. A number of different factors such as atypical symptoms, skip lesions, suboptimal sampling and ongoing steroid treatment affect the results. Temporal artery biopsy is an easily-performed and reliable diagnostic method if only made after accurate clinical evaluation and if adequate sampling was made in early period.

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Key Words: Temporal artery biopsy, Temporal arteritis, Vasculitis

ÖZET

Amaç: Temporal arterit, büyük ve orta boy damarları etkileyen sistemik bir vaskülittir. Doğru tanı için vaskülit belirtileri gösterilmelidir. Bu nedenle temporal arter biyopsisi tanı için hala altın standarttır. Bu çalışmada temporal arter biyopsisi yapılan hastaları değerlendirdik.

Gereç ve Yöntemler: Eylül 2004-Haziran 2014 tarihleri arasında temporal arterit yakınması olan 36 hastanın temporal arter biyopsi işlemi yapıldı. Hastalar klinik özellikleri, uygulanan prosedürleri ve sonuçları için retrospektif olarak değerlendirildi.

Bulgular: Temporal arter biyopsisi için kliniğimize başvuran 35 hasta çalışmaya alındı. Bunlardan 11'i (% 30.5) erkek, 25'i kadın (% 69,5) ve yaş ortalaması 61.1 (56-81 arasında) idi. Ortalama eritrosit sedimentasyon hızı 56.3 mm / saat idi (51-130 arası). Bizim çalışmamızda, 7 (% 19.4) hastada temporal arterit ile uyumlu bulgular vardı. Komplikasyon olarak, sadece bir hastada sağ orbital bölgede bir hafta süren ekimoz vardı.

Sonuç: Literalde temporal arter biyopsilerinin pozitiflik oranları ile ilgili farklı sonuçlar yayınlanmıştır. Atipik semptomlar, atlanan lezyonlar, suboptimal örnekleme ve devam eden steroid tedavisi gibi bir takım farklı faktörler sonuçları etkilemektedir. Temporal arter biyopsisi, sadece doğru klinik değerlendirmeden sonra yapılırsa ve erken dönemde yeterli örnekleme yapıldığında kolay ve güvenilir bir tanı yöntemidir.

Anahtar Kelimeler: Temporal arter biyopsisi, Temporal arterit, Vaskülit

INTRODUCTION

Temporal artery biopsy (TAB) is still the gold standart diagnostic method for temporal arteritis (TA). Histopathological examination of TAB samples shows granulomatous inflammation, often with multinucleated giant cells in the arterial wall, and interruption of the internal elastic laminea [1] .TAB is a simple and well tolerated technique, however, its sensitivity has been questioned. This is primarily due to the nature of the TA which is characterized by skip lesions, and pathological changes may be missed in a TAB taken in a free segment of arteritis. Therefore, there is a need for a 2 cm or greater length of sample and multipl histological sections for diagnostic TAB[2]. Here, patients who underwent temporal artery biopsy were evaluated in our clinic.

MATERIAL and METHODS

The medical records of patients who underwent TAB in our clinic, between September 2004 and June 2014 were reviewed retrospectively, with the written and signed permission of department of cardiovascular surgery council members. A total of 36 consecutive patients

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included in this study. Patients with a diagnosis of polymyalgia rheumatica, previous temporal artery biopsy, and recently started corticosteroid therapy, were excluded. Demographic features and results of patients were presented in Table 1. Procedure was performed under local anesthesia for all patients. Monitoring included arterial blood pressure and electrocardiogram. The surgical technique consisted of determination of the superficial temporal artery trace, skin incision, identifying the superficial temporal artery and biopsy specimen excision (Fig 1a, 1b, 1c, 1d). Desicion of unilateral or bilateral TAB was based on clinical findings and a total of 48 TAB were performed for 36 patients. Biopsy samples were taken at least 2 cm in length. Postoperative complications (hemorrhage, wound infection, ocular complaints…etc) were reviewed. Datas were collected retrospectively from patient records.

RESULTS

Between September 2004 to June 2014, 36 consecutive patients, who referred to our department with a clinical suggestion of active temporal arteritis were enrolled in this study. Patient characteristics and clinical features are shown in Table-1. Twenty five patients (69.5%) were female and eleven (30.5%) were male. Mean age was 61.1 (range 56 to 81) years. In these patients, the most common presenting symptom was unilateral headache in 28 (77.8%) patients. Mean erytrocyte sedimentation rate (ESR) was 56.3 (range 51 to 130) mm/hr. All patients were discharged at the same operation day. The mean length of the biopsy specimen was 2.3 (range 2.1 to 3.6) cm. Procedure was performed bilaterally in 12 (33.3%) pateints. In our study, a total of 7 (19.4%) patients had positive biopsies and they all were over 65 years old with ESR higher than 80 mm/hr. There were no mortality and significant postoperative complications in this study. Only 1 (2.8%) patients had transient ecchymosis on the right periorbital region and healed in a few days spontaneously.

DISCUSSION

TA or GCA is a primary systemic vasculitis that affects 18/100 000 of the people over the age of 50. The incidence rises steadily after age 50 years and is highest between 70-80 years of age. TA is two to four times more common in women compared to men[3]. It appears to have a distinct racial and geographical distribution and higher incidence of this condition is seen in population from Northern European countries. TA affects large and medium sized arteries

with a predilection for the external carotid artery branches[4]. The most common presenting symptoms of TA include headache, jaw claudication, polymyalgia rheumatica and visual problems[5]. The most feared complication of the disease is blindness and loss of vision is usualyy irreversible despite treatment. On the other hand, TA is an inflammatory disease with good response to steroid therapy. But prolonged steroid therapy can lead to some adverse effects such as osteoporosis, pathological fractures, and gastrointestinal bleeding[6]. Therefore, early and accurate diagnosis is very important.

The American College of Rheumatology (ACR) defined clinical classification criteria for TA diagnosis and for the diagnosis of TA, at least any three of criteria, listed in Table 2, must be presented which yield 93.5% sensitivity and 91.2 % specificity.

Positive TAB provides the most definite evidence of TA, but the positive yield of this test is low. In the literature, very different rates are available and ranges from 5% to 34%. In our study, the positive biopsy rate was 19.4% with a total of 7 patients, and these results were similar to the literature. A number of factors that has been advanced to explain false negative TAB results, such as clinical and/or laboratory evaluation, length of the sample taken, unilateral or bilateral procedure, steroid used in the treatment, and histological examination[7]. Thus, selection of the appropriate patient before the TAB is very important.

Careful physical examination, including palpation of the temporal arteries, accompanied by an accurate medical history and laboratory findings are all imperative fort he diagnosis of TA[8]. For example, headache, jaw pain, and visual disturbances are the most common symptoms but these findings can be seen in many diseases; e.g. hypertansion, migraine and trigeminal neuralgia. The diagnosis of TA should be considered in a patient over the age of 50 years who presents with new onset unilateral headache and accompanied visual disturbances or jaw claudication. ESR is usually elevated, but is not spesific. ESR levels exceeding 100 mm/hr have been shown to be associated also for serious infections, connective tissue disorders or metastatic tumors. Thus ESR is a useful confirmative test in patients with a suggestive history but it is not always elevated at diagnosis[9]. Before the procedure, steroid use in treatment can yield false results. However, positive biopsy results may be found following steroid treatment for TA. Achkar et al. reported that steroids have little effect on the histological diagnosis within two-week of time frame[10]. Some authors adviced that biopsy should be done bilaterally to improve the diagnostic sensitivity. In a study, a positive biopsy sample was found in 5% of

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those who had a normal TAB from the opposite side[11]. In this study, a total of 7 (19.4%) patients had positive biopsies and all were over 65 years old and mean ESR higher than 80 mm/hr. Bilateral TAB was performed in 12 patients and a total of 48 TAB were performed for 36 patients.

Negative biopsy results do not always exclude the diagnosis due to the skipping characteristics of the disease. TA is typically defined as having skip lesions and can be found in any temporal artery segment as short as 330 μm in length. Because of the segmental characteristics of the inflammatory involvement in TA, pathological findings may be missed in a TAB taken in free-segment of artery. Therefore, it is necessary to maximize the biopsy sample. According to some investigators samples should be taken at least 2 cm or longer, but TAB length yielding optimal diagnostic sensitivity remains unknown[1]. In our study, the mean length of the biopsy specimen was 2.3 (range 2.1 to 3.6) cm.

TAB is a simple procedure and often performed under local anesthesia. However, this operation is not without complications and may cause some discomforts. Possible complications include postoperative hematoma, scalp or skin necrosis, wound infection, facial nerve injury, eyebrow dropping and rarely stroke[12]. In addition, samples may be venous or nerve origin unintentionally[13]. Thus, different diagnostic methods have been investiagated for TA.

Color doppler ultrasonography (CDU) is a noninvasive, cheap and simple diagnostic method and results can be obtained quickly. It can be performed bilaterally and can be performed along the artery which may reduce the chance of false-negative results associated with skip lesions. In 1995, Schmidt et al was the first to report the use of CDU in the diagnosis of TA as an alternative to TAB. Hypoechoic halo sign is highly spesific CDU finding for TA. It is a dark area around the vessel lumen probably due to arterial wall edema[14]. However, the diagnostic value of CDU has been debated. Salvarani et al reported low sensitivity (40%) and specificity (79%) for CDU[15]. Schmidt et al reported that hypoechoic halo sign disappeared after 10 to 16 days (total range, 7-56 days) of corticosteroid therapy[14]. In addition, evaluation is person-dependent and requires experience. Today, CDU is used primarily as an adjunct to TAB in the diagnostic process, rather than an alternative[16].

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Recently, high-resolution magnetic resonance imaging (MRI) of the superficial cranial arteries was introduced, with promising results. Here, images can be easily acquired with a standardized protocol of short duration and making the data asquisition independent of the observer. There is no significant difference between CDU and MRI sensitivity and specificity rates. Compared with CDU, however, high-resolution MRI is more expensive and less widely available[17,18].

CONCLUSION

TA can be diagnosed using ACR scoring system, but histological examination of TAB specimens is still the gold standart for the diagnosis of TA. Although headache, jaw claudication and visual disturbances are the most common symptoms, these findings can be seen in many diseases, such as hypertansion, migraine and trigeminal neuralgia. Thus, most clinicians prefer to have pathological confirmation before starting treatment. Positive biopsy has a specificity of 100%, but negative biopsy does not always exclude the diagnosis due to the segmental nature of disease. If the histological result is negative, clinicians should follow the algorithm described in the ACR scoring system.

Clinical, laboratory and histological data should be analyzed carefully for correct diagnosis and help guide the clinician's choice of appropriate therapy. CDU is a cheap, non-invasive, reproducible and easy to perform method that should precede TAB for TA patients.

Conflicts of interest: There is no conflicts of interest

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Feature		
Gender (%)	**Female**	69.5 (n=25)
	Male	30.5 (n=11)
Mean age (years)		61.1 (range 56 to 81)
Headache (%)		77.8 (n=28)
Mean ESR (mm/h)		56.3 (range 51 to 130)
Mean biopsy length (cm)		2.3 (range 2.1 to 3.6)
Bilateral TAB (%)		33.3 (n=12)
Positive TAB (%)		19.4 (n=7)
Complication rate (%)		2.8 (n=1)

Table 1: Patient Characteristics

Criteria	
1. Age at disease onset ≥ 50 years	Development of symptoms or findings beginning at age 50 years or older
2. New headache	New onset of or new type of localized pain in the head
3. Temporal artery abnormality	Temporal artery tenderness to palpation or decreased pulsation, unrelated to arteriosclerosis of cervical arteries
4. Elevated ESR	ESR ≥ 50 mm/h by the Westergren method
5. Abnormal artery biopsy	Biopsy specimen with artery showing vasculitis characterised by a predominance of mononuclear cell infiltration or granulomatous inflammation, usually with multinucleated giant cells
Not: For purposes of classification, a patient shall be said to have TA if at least three of these five criteria are present.	

Table-2: American College of Rheumatology Criteria For Temporal Arteritis

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Fig 1a: Determination of the superficial temporal artery trace

Fig 2a: Skin Incision

Fig 3a: Identifying the temporal artery

Fig 4a: Biopsy Specimen

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