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Research Article

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Clinicopathological Evaluation of Supraclavicular Fossa Masses: A Retrospective Study of 108 Patients

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Abstract

Objective: Supraclavicular fossa masses present a diagnostic challenge because of their location at a critical anatomical junction and their wide range of different aetiologies. There are currently few studies in the literature that particularly address supraclavicular fossa masses, despite the region's clinical relevance. This study aims to analyse patients who presented to our clinic with a mass in the supraclavicular fossa and were diagnosed via open biopsy.

Material and Methods: The medical records of patients who underwent excisional or incisional biopsy for supraclavicular fossa masses in our clinic and were subsequently diagnosed through histopathological examination were retrospectively reviewed. The findings were analysed and discussed.

Results: A total of 108 patients were included in the study, comprising 58 males (53.7%) and 50 females (46.3%), with a mean age of 52.7 years (range: 12-86). Biopsies were performed on the left supraclavicular fossa in 65 patients (60.1%) and on the right in 43 patients (39.9%). Malignant metastases were detected in 54.8% of incisional biopsies and in 23.3% of excisional biopsies. The incidence of malignancy was 65.8% in patients over 40 years of age, compared to 88% in those aged 18–40 years. Malignant pathologies were more common in males (75.9%) than in females (64%). Malignancy was identified in approximately two-thirds of the biopsies from both sides. Histopathological analysis revealed malignant lymphoproliferative disease in 41 patients (37.9%), malignant metastases in 35 (32.4%), inflammatory/reactive processes in 28 (25.9%), and benign mesenchymal neoplasms in 4 (3.7%).

Conclusion: Supraclavicular fossa masses encompass a broad differential diagnosis. Clinicians should maintain a high index of suspicion for malignancy, particularly among adult patients.

Keywords Supraclavicular fossa · neck neoplasms · differential diagnosis · biopsy · histopathology

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INTRODUCTION

A neck mass is one of the most frequent complaints encountered in otorhinolaryngologic practice. Its differential diagnosis can be challenging as it can be the initial manifestation of a systemic illness. Prompt diagnosis and management are essential, particularly in cases where malignancy is suspected. In such situations, a comprehensive history of the patient, thorough physical examination, and selective application of imaging and biopsy techniques are imperative (1). Key factors to assess during the anamnesis include the patient's age, the growth pattern of the mass, associated systemic symptoms, and the anatomical location of the lesion. Physical examination should extend beyond routine head and neck assessment to include scalp inspection and endoscopic evaluation. When lymphoproliferative disease is suspected, examination should also involve the axillary and inguinal lymph nodes, spleen, and liver, with appropriate specialist consultations as needed. Excisional biopsy of masses that are suspected to be benign on initial evaluation allows for simultaneous diagnosis and treatment.

Masses of the supraclavicular fossa, especially in patients over 40 years of age, are suspicious for malignancy and should be thoroughly evaluated further. In masses of the left supraclavicular fossa, metastatic carcinoma of the breast, lung, gastrointestinal tract, or genitourinary tract should be suspected because of drainage pathways, and the diagnostic work-up should be conducted accordingly. Anatomically, the supraclavicular fossa also houses some vital veins, arteries, nerves, and lymphoid tissues in the superficial and deep planes. Hence, if open biopsy is being contemplated for diagnostic purposes, the surgeon has to be very cautious because of the possibility of damage to neighbouring neurovascular structures (1, 2).

Masses in the supraclavicular fossa have a wide differential histopathological diagnosis because of their anatomically strategic nature. In this paper, we wanted to present cases that were diagnosed through histopathological examination following open biopsy of masses in the supraclavicular fossa in our clinic and to review them considering the literature.

MATERIAL AND METHODS

Our study was initiated after obtaining approval from the Dokuz Eylul University Non-Invasive Research Ethics Committee (Date: 27.07.2017, No: 2017/19-01). Patients who received a histopathological diagnosis of a supraclavicular fossa mass via open biopsy between January 2005 and April 2017 were retrospectively reviewed and included in the study.

The parameters analysed included the type of open biopsy (excisional vs. incisional), laterality of the mass (right or left), patient age and gender, and whether FNAB had been performed prior to the open biopsy. Age was categorised into three groups: 0–18 years, 18–40 years, and over 40 years.

RESULTS

The study included 108 patients. Fifty-eight (53.7%) were male and 50 (46.3%) were female. The mean age of the patients was 52.7 years (12-86). The final histopathological diagnosis was reached by sampling the masses in the left supraclavicular fossa of 65 patients (60.1%) and the right supraclavicular fossa of 43 patients (39.9%). According to the type of biopsy performed, 18 of the masses that underwent excisional biopsy were malignant metastases, 33 were lymphoproliferative, three were benign mesenchymal neoplasm, and 23 were due to inflammatory causes. Seventeen of the masses that underwent incisional biopsy were malignant metastases, eight were lymphoproliferative, one was a benign mesenchymal neoplasm, and five were due to inflammatory/reactive causes (Table 1). Incisional biopsy was preferred in fragile masses, invading the surrounding tissue, large and associated with vital structures.

Table 1. Distribution of aetiological causes by biopsy type

Distribution of aetiological causes by biopsy type			
Biopsy type		**n**	**% (by each biopsy type)**
Excisional			
	Malignant		
	Metastases	18	23.3
	Lymphoma	33	42.9
	Nonmalignant		
	Benign mesenchymal neoplasm	3	3.9
	Inflammatory/reactive	23	29.9
Incisional			
	Malignant		
	Metastases	17	54.8
	Lymphoma	8	25.9
	Nonmalignant		
	Benign mesenchymal neoplasm	1	3.2
	Inflammatory/reactive	5	16.1

A solitary supraclavicular fossa mass was detected in 42 patients. Thirty (71.4%) were in the left and 12 (28.6%) were in the right supraclavicular fossa. Four of the solitary masses found in the right supraclavicular fossa were malignant metastases, four were lymphoproliferative, two were benign mesenchymal neoplasms, and two were due to inflammatory/reactive causes. Eleven of the masses found in the left supraclavicular fossa were malignant metastases, nine were lymphoproliferative, two were benign mesenchymal neoplasms, and eight were due to inflammatory/reactive causes (Table 2 and Table 3).

Table 2. Distribution of right supraclavicular solitary masses by aetiology

Distribution of right supraclavicular solitary masses by aetiology		
Aetiology	**n**	**%**
Malignant		
Metastases		
Pulmonary		
Small Cell	2	16.6
Unknown (CUP)	2	16.6
Lymphoma		
NonHodgkin	2	16.6
Hodgkin	2	16.6
Nonmalignant		
Benign mesenchymal neoplasm		
Lipoma	1	8.3
Leiomyoma	1	8.3
Inflammatory/reactive		
Nonspecific		
Granulomatous	1	8.3
Hydatid cyst	1	8.3
Total	12	

CUP: Cancer of unknown primary

Table 3. Distribution of left supraclavicular solitary masses by aetiology

Distribution of left supraclavicular solitary masses by aetiology		
Aetiology	**n**	**%**
Malignant		
Metastases		
Pulmonary		
Small Cell	2	6.7
AdenoCa	1	3.3
Breast	1	3.3
Thyroid papillary	1	3.3
Pancreas	1	3.3
Prostate	1	3.3
Bladder	3	10
Ovaries	1	3.3
Lymphoma		
NonHodgkin	7	23.3
Hodgkin	2	6.7
Nonmalignant		
Benign mesenchymal neoplasm		
Lipoma	2	6.7
Inflammatory/reactive		
Nonspecific		
Reactive follicular	3	10
Granulomatous	2	6.7
Necrotising granulomatous	1	3.3
Suppurative granulomatous	1	3.3
Chronic inflammatory	1	3.3
Total	30	

According to the age groups, two of the masses found in the 0-18 age range were lymphoproliferative and two were inflammatory/reactive; three of the masses found in the 18-40 age range were malignant metastases, 19 were lymphoproliferative and three were inflammatory/reactive; 32 of the masses found above 40 years of age were malignant metastases, 20 were lymphoproliferative, four were benign mesenchymal neoplasms and 23 were due to inflammatory/reactive causes (Table 4).

Table 4. Distribution of aetiological causes by age group

Distribution of aetiological causes by age group			
Age Group		**n**	**% (by each age group)**
0-18			
	Malignant		
	Metastases	0	-
	Lymphoma	2	50
	Nonmalignant		
	Benign mesenchymal neoplasm	0	-
	Inflammatory/reactive	2	50
18-40			
	Malignant		
	Metastases	3	12
	Lymphoma	19	76
	Nonmalignant		
	Benign mesenchymal neoplasm	0	-
	Inflammatory/reactive	3	12
Over 40			
	Malignant		
	Metastases	32	40.5
	Lymphoma	20	25.3
	Nonmalignant		
	Benign mesenchymal neoplasm	4	5,1
	Inflammatory/reactive	23	29,1

According to the gender, 25 of the masses found in males were malignant metastases, 19 were lymphoproliferative, one was benign mesenchymal neoplasms and 13 were due to inflammatory/reactive causes and 10 of the masses found in females were malignant metastases, 22 were lymphoproliferative, three were benign mesenchymal neoplasms and 15 were due to inflammatory/reactive causes (Table 5).

Table 5. Distribution of aetiological causes by gender

Distribution of aetiological causes by gender			
Gender		**n**	**% (by each gender)**
Male			
	Malignant		
	Metastases	25	43.2
	Lymphoma	19	32.7
	Nonmalignant		
	Benign mesenchymal neoplasm	1	1.7
	Inflammatory/reactive	13	22.4
Female			
	Malignant		
	Metastases	10	20
	Lymphoma	22	44
	Nonmalignant		
	Benign mesenchymal neoplasm	3	6
	Inflammatory/reactive	15	30

According to the etiologic causes, 35 (32.4%) of the masses scanned in all patients were malignant metastases, 41 (37.9%) were lymphoproliferative, four (3.9%) were benign mesenchymal neoplasms, and 28 (26.9%) were due to inflammatory/reactive causes (Table 6). Thirty-four of the malignant masses were diagnosed as malignant metastases or deposits, and one was diagnosed as myeloid sarcoma secondary to acute myeloid leukaemia. Fourteen of the distant metastases were lung, three were breast, three were bladder, two were prostate, two were pancreas, two were ovarian, one was thyroid, one was liver, and one was adrenal gland carcinoma metastases. Epithelial malignancy of the unknown primary was detected in three patients and neuroendocrine tumour metastasis of the unknown primary was detected in two patients. Twenty-one of the lymphoproliferative masses were diagnosed as Hodgkin lymphoma, 19 were non-Hodgkin lymphoma (NHL), and one was Castleman disease. Three of the benign mesenchymal neoplasm masses were lipomas and one was a leiomyoma. Fifteen of the masses due to inflammatory/reactive processes were granulomatous inflammation, eight were reactive follicular hyperplasia, two were nonspecific chronic inflammatory response, one was Kikuchi-Fujimoto disease, one was primary amyloid deposition, and one was isolated hydatid cyst. In further examination, the definitive diagnosis was tuberculous lymphadenitis in two patients with lesions compatible with necrotising granulomatous reaction.

Fine needle aspiration biopsy (FNAB) was performed in nine patients in the preoperative period. Three patients' results were reported as non-diagnostic, and the final histopathology results favoured benign pathologies. Atypical lymphoid cells were observed in three patients, and the final histopathological examination favoured lymphoma. Malignant cells were observed in three patients, and the final histopathological examination favoured metastatic malignant tumour.

Table 6. Distribution of all supraclavicular masses by aetiology

Distribution of all supraclavicular masses by aetiology			
Aetiology		**n**	**%**
Malignant			
	Metastases	**35**	**32.4**
	Pulmonary		
	Small Cell	4	
	AdenoCa	8	
	Non-small-cell	1	
	Neuro-endocrine	1	
	Thyroid papillary	1	
	Breast	3	
	Hepatic	1	
	Pancreass	2	
	Adrenal gland	1	
	Ovaries	2	
	Prostate	2	
	Bladder	3	
	Myeloid sarcoma	1	
	Epithelial malign (CUP)	3	
	Neuro-endocrine (CUP)	2	
	Lymphoma	**41**	**37.9**
	Malignant		
	NonHodgkin	19	
	Hodgkin	21	
	Castleman	1	
Nonmalignant			
	Benign mesenchymal neoplasm	**4**	**3.7**
	Lipoma	3	
	Leiomyoma	1	
	Inflammatory/reactive	**28**	**25.9**
	Reactive follicular	8	
	Granulomatous	5	
	Necrotising granulomatous	9	
	Suppurative	1	
	Chronic inflammatory	2	
	Kikuchi-Fujimoto	2	
	Amyloid deposition	1	
	Hydatid cyst	1	
Total		108	

CUP: Cancer of unknown primary

Twenty-three of the patients had previously received treatment for malignant processes and were being followed up. Recurrence was detected in 16 of these patients because of the supraclavicular fossa mass biopsy. Six of them were lymphoproliferative diseases and 10 were distant organ metastases. Three of the distant metastases were lung, three were bladder, two were breast, one was prostate, and one was ovarian recurrence.

The internal jugular vein and subclavian vein injuries occurred during surgery in three cases. Venous laceration was repaired without any problems by primary suturing. In eight cases, collections (haematoma, seroma) occurred at the operation site in the postoperative period and were resorbed during the follow-up period without the need for any additional intervention.

DISCUSSION

Neck masses are one of the most common conditions in otolaryngology practice. Systemic diseases should always be considered during clinical evaluation and differential diagnosis in patients presenting with these symptoms. Neck masses are classified into three main groups: congenital, inflammatory, and neoplastic masses. When examining patients presenting with the symptoms of a mass in the neck, the patient's age, gender, socioeconomic status, living place, profession; the presence of a previously diagnosed malignancy; the localisation of the mass and physical examination characteristics are taken into consideration in the search for differential diagnoses. In patients presenting with symptoms of a mass in the supraclavicular fossa, lymphadenopathies are the most common aetiology. In the evaluation and follow-up of these masses, a biopsy should be planned if there is suspiciously rapid growth (<2 weeks) and no dimensional regression is detected in the following period (8-12 weeks). Minimally invasive fine-needle aspiration biopsies and core-needle biopsies can be performed during the biopsy process (1-4).

Malignant pathologies should be considered for rapidly progressing, hard, fixed, painless masses bigger than 2-2.5 cm, located in the posterior cervical and supraclavicular regions; benign pathologies should be considered for masses smaller than 1.5 cm, soft, containing signs of inflammation, and dimensionally stable or regressing (5). Laboratory findings such as LDH and uric acid in lymphoproliferative diseases and CEA, CA125, CA15-3, and CA19-9 marker levels in distant organ metastases are useful in differential diagnosis.

In radiological examinations, ultrasonography can detect approximately half of the non-palpable occult metastases. The sensitivity and specificity of ultrasonography in detecting pathological masses are higher than those of palpation. The sensitivity and specificity of ultrasonography were 91% and 94%, respectively, while the sensitivity and specificity of palpation were 82% and 83%, respectively. Therefore, in case of clinical suspicion, ultrasonographic examination is useful for detecting occult metastases (6).

The use of cross-sectional imaging (CT, MR, and PET/CT) in the diagnosis of head and neck masses is quite common in practice. Contrast-enhanced neck CT and MRI enable the detection of masses in the head and neck region, such as the thyroid, pharynx, larynx, and cervical oesophagus, and help stage malignant pathologies. In case of suspicion of distant malignant tumour metastasis in masses located in the supraclavicular fossa, unlike other cervical regions, it is also possible to detect the primary tumour site originating from other systems such as the lung, breast, the gastrointestinal and genitourinary system with PET/CT. In a study by Lee et al., it was stated that PET/CT has a slight superiority over other imaging methods. In a study conducted by Zhou et al., it was stated that PET/CT provides an opportunity for early diagnosis because it detects biological and molecular changes before anatomical changes. In addition, diagnostic difficulties due to inflammatory pathologies should be kept in mind as a disadvantage of PET/CT (7-9).

Fine needle aspiration biopsy (FNAB) is one of the pathological diagnostic methods planned at the first stage in malignant metastases because it does not require a long-term surgical procedure, can be applied in outpatient clinic conditions, and is cost-effective. In a study by Ellison et al. (10), 97% sensitivity, 98% specificity and 8% non-diagnostic results were obtained for malignancies in patients undergoing FNAB, whereas in a study by Saha et al. (11) found 42% non-diagnostic results. Furthermore, accuracy increased to 98% in USG-guided core biopsy, while non-diagnostic rates decreased to less than 6% and complication rates remained below 2%. Regardless, open biopsy can be considered the gold standard with diagnostic accuracy rates close to 100%. However, it has several disadvantages, such as long incision length, long operation time (>10 min) and hospitalisation, high expenses and risk of complications up to 18% (12, 13).

In masses detected in patients previously diagnosed with malignancy, FNAB is a procedure that can be performed safely at the first stage. However, an open biopsy is required for a definitive diagnosis in pathologies such as lymphoma subgroups, sarcomas, and tuberculous lymphadenitis (2, 14,15). Therefore, a negative FNAB result does not definitively exclude malignancy (16). In inflammatory and benign pathologies, FNAB does not make a significant diagnostic contribution at the definitive diagnostic stage, as stated in our study and the literature (2). Distant metastases are more frequently observed in the supraclavicular fossa, especially compared with other cervical regions. A meta-analysis by Layfield et al. reported that fine-needle aspiration biopsies had 84% sensitivity and 90% specificity for epithelial tumour metastases and 63% sensitivity and 95% specificity for adenocarcinoma metastases of lung cancer. Therefore, in the supraclavicular fossa, which is the cervical region where adenocarcinoma metastases are most frequently seen, it is more rational to perform excisional/incisional biopsy in case of clinical suspicion, both diagnostically and in terms of time management (17).

Lymphoproliferative diseases are also among the differential diagnoses of masses in the neck. Masses occurring in other parts of the body (axillary, inguinal etc.), abdominal swelling, shortness of breath, weight loss of up to 10% of the body in six months, night sweats and fever are seen in the clinical evaluation.

Lymphoproliferative diseases should be considered in patients with high sedimentation, uric acid, LDH, and serum IL-2r levels in laboratory tests, and treatment should be planned by reaching a histopathological diagnosis quickly (6). When lymphoproliferative diseases are considered in the differential diagnosis of patients applying to our clinic, the reasons for not performing FNAB after examinations for epithelial malignant tumour metastasis are as follows: the inability to obtain sufficient diagnostic samples in this disease group, inability to detect the lymphoma subtype and loss of time while waiting for the FNAB result.

The supraclavicular fossa is the anatomical subregion that lies between the middle 1/3 of the clavicle, the lower belly of the omohyoid muscle and the posterior border of the sternocleidomastoid muscle, and is superficial to the deep layer of the deep cervical fascia covering the scalene muscles. The supraclavicular fossa includes the third part of the subclavian artery, the subclavian vein and internal jugular vein, the suprascapular and transverse cervical arteries, and the major lymphatic ducts (18). In addition, there are vital and functional structures such as the phrenic nerve, brachial plexus, and subclavian artery under the deep layer of the deep cervical fascia. Because this region contains the main lymphatic ducts and vital vascular and nerve structures, complication rates of up to 12% morbidity and 3% mortality have been reported while performing open surgical biopsy. Complications such as pneumothorax, phrenic nerve and brachial plexus injuries, supraclavicular nerve injuries, Horner syndrome, haematoma, lymphedema, chylous fistula, and chylothorax can be observed during and after surgery (19-22). In our series, only three cases (2.7%) had internal jugular vein and subclavian vein injuries during surgery, and vascular repair was performed during surgery.

The supraclavicular fossa is a region where lymphatic metastases of the infraclavicular visceral organs are frequently seen. In the supraclavicular fossa, the right lymphatic duct and the thoracic duct, which are the main lymphatic structures participating in the venous circulation, are located at the junction of the internal jugular vein and the subclavian vein (Pirogoff angle). The right lymphatic duct provides lymphatic drainage of the right head and neck, right hemithorax, and right upper liver, while the thoracic duct provides lymphatic drainage of all other regions outside this area (23). Therefore, the risk of distant organ metastasis is higher in the left supraclavicular fossa masses. Bronchopulmonary malignancies are the most common distant organ metastases to the supraclavicular fossa, followed by breast carcinoma (5). In urogenital carcinomas, the supraclavicular fossa is also one of the most common regions for distant lymphatic metastases (24). In the study by Franzen et al., metastases originating from the infraclavicular region were detected in 94/117 (80.3%) of the cases (1). In our series, 29 (82.8%) of the 35 malignant tumour metastases were from the infraclavicular region, five were from the malignancy of unknown primaries, and one was from thyroid malignancy.

The aetiology of multiple masses is generally not different from that of solitary masses. In a study conducted by Aydın et al., 43% of the screened solitary supraclavicular masses were found to be malignant, while in our study, 66.6% were found to be malignant (2). In the mentioned study, 84% of the malignancies were lymphoproliferative and 16% were distant organ metastases, while in our series, almost half of the malignancies were lymphoma and the remainings were the distant organ metastases. Our findings show higher malignancy rates than the study reported by Aydın et al., which may be due to the differences in patient selection and the referral patterns. Aydin et al. excluded patients with a history of malignancy, and due to serving as a military-based facility, the age distribution and proportion of female patients were limited.

One of the most important parameters in the approach to supraclavicular fossa masses is age. The rate of congenital and inflammatory masses increased in the paediatric age group, inflammatory/reactive masses in the young adult age group, and malignant masses in the adult and elderly patient groups. It is stated that 58-83% of supraclavicular fossa masses in patients over the age of 40 years are malignant and 65-90% of these malignant masses are metastases of cancers originating from infraclavicular regions (3, 5). In a series of 113 cases conducted by Hetemoğlu and Erbek in which cervical lymph nodes were scanned, malignancy rates of 33% and 22% were observed in the 0-18 and 18-40 age ranges, respectively, while this rate increased to 56% over the age of 40 years (25). In our study, no malignant mass was found in the paediatric age group. While the majority of masses detected in the age group between 18 and 40 years were lymphoproliferative diseases (76%), distant organ metastases (40.5%) were more common in the group over 40 years of age. The high rate of malignancy in cases over the age of 40 is consistent with the literature, but the higher rate of lymphatic malignancy detected in the 18-40 age group distinguishes our study from the literature (26). This finding may be due to our hospital being a tertiary referral centre in the field of haematology, which results in an increased incidence of lymphoproliferative malignancies in the 18-40 age group.

Congenital masses are also pathologies that should be considered in the differential diagnosis of neck masses in the paediatric age group. In this age group, vascular and lymphatic malformations can be seen in the supraclavicular fossa (2). In our clinic, no congenital mass was detected in the paediatric group in which excisional biopsy was performed in the supraclavicular fossa. The reason for this is that cases whose preliminary diagnosis was made with the help of cross-sectional imaging were referred to specialists who would provide management for medical treatment or sclerotherapy.

In our series, differences were observed between male and female cases in terms of the incidence of malignant pathologies. We

observed that lymphoproliferative pathologies were more common in female patients, whereas metastatic malignant pathologies were more common in male patients. When evaluated with the literature, it is seen that malignant tumour metastases in the supraclavicular fossa are more common in the male population. Therefore, our findings are consistent with the current literature in this respect (27, 28).

In cases where a malignant disease has been previously diagnosed and treated, the possibility of recurrence should be considered if a mass is detected in the supraclavicular fossa. In our study, a recurrence rate of 69.5% (n=16) was detected in the open biopsies of 23 patients who were previously treated for malignancy and had a mass in the supraclavicular fossa.

Benign neoplastic pathologies are primarily considered in masses that have been present for a long time, do not show rapid dimensional progression, and do not usually exhibit signs of inflammation. In our study, three cases with lipoma and one with leiomyoma were also admitted with complaints of long-term, dimensionally stable, painless masses. Performing excisional biopsy in masses thought to be benign neoplastic allows diagnosis and treatment to be carried out simultaneously. In our study, it was observed that most masses in the supraclavicular fossa were malignant pathologies (70.3%) and benign neoplastic masses were detected at a rate of 3.7%. In other words, metastatic and lymphoproliferative malignant masses were seen at a rate 18 times higher than that of benign neoplasms in our case series (2, 5).

Supraclavicular fossa masses that develop more rapidly than benign masses and have signs of inflammation and systemic symptoms should be considered inflammatory/reactive pathologies. These are more common in children and young adults. In our series, inflammatory/reactive pathologies were detected in 50% of paediatric patients. Apart from suppurative lymphadenitis and deep neck abscesses, cat abrasion disease, tuberculous lymphadenitis, toxoplasma, and brucella infection causing granulomatous reaction may occur. Kimura, Kikuchi-Fujimoto, Sarcoidosis and Rosai Dorfman diseases that cause noninfectious inflammatory reactions should also be considered in differential diagnoses (29).

Malignant pathologies were observed at a higher rate in the incisional biopsies taken in our series compared with the excisional biopsies because the malignant masses were large in size, were close to vital structures, and invaded the surrounding tissue. Additionally, two of the masses with internal jugular vein injury during surgery occurred during the incisional biopsy. Therefore, in such cases, it is necessary to be careful in terms of complications in incisional biopsy, which is considered safer.

In our study, very rare pathologies such as isolated hydatid cyst infection in the supraclavicular fossa, pancreatic carcinoma metastasis, primary amyloid deposition, hepatocellular carcinoma metastasis, adrenal gland carcinoma metastasis, and leiomyoma were also detected.

CONCLUSION

In conclusion, supraclavicular fossa masses are lesions that should be investigated rapidly and effectively, especially in the population over 40 years of age, by taking a meticulous history, performing a physical examination, and using rational laboratory and radiological examinations. In addition, when evaluating these masses, an extensive differential diagnosis list should be considered in the clinical evaluation because it is at an important junction in terms of neurovascular structures; therefore, it is necessary to be vigilant in terms of complications in open biopsy.

Ethics Committee Approval	Ethics committee approval was received for this study from the ethics committee of Dokuz Eylül University Non-Invasive Research Ethics Committee (Date: 27.07.2017, No: 2017/19-01).
Informed Consent	Due to the retrospective design of the study, informed consent was not taken.
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