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Histological features in routine tonsillectomy specimens: the presence and the proportion of mesenchymal tissues and seromucinous glands

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Abstract

Tonsillectomy is a frequently performed operation but there is little information about the histological features of a tonsillectomy specimen. In this study, we re-evaluated archival materials of 1220 cases who underwent tonsillectomy because of hyperplastic tonsils. Haematoxylin and eosin sections of the cases were re-examined and the presence and the proportion of mesenchymal tissues (skeletal muscle, cartilage, fat, bone) and seromucinous glands were noted as focal, multifocal or abundant. The incidence of skeletal muscle was 89 per cent (1085 cases; 206 focal, 465 multifocal, 414 abundant), seromucinous glands 35 per cent (429 cases; 236 focal, 134 multifocal, 59 abundant), fat 21 per cent (251 cases; 208 focal, 43 multifocal), cartilage three per cent (31 cases), and bone one per cent (seven cases). Also in 165 cases (14 per cent) skeletal muscle, in 12 cases (one per cent) was seromucinous glands, in eight cases (one per cent) was cartilage, in seven cases (one per cent) fat, and in four cases (less than one per cent) bone were found between hyperplastic lymphoid tissue. It can be concluded that mesenchymal tissues (skeletal muscle, cartilage, fat, bone) and seromucinous glands may be seen in different proportions in routine tonsillectomy specimens.

Key words: Tonsil; Tissue; Mesoderm; Tonsillectomy

Introduction

Inspection of the tonsilla palatina is a part of routine physical examination and tonsillectomy is a frequently performed operation as a result of hyperplastic tonsil-related problems, but there is little information about the microscopic findings in a tonsillectomy specimen both in textbooks of pathology and in the literature.[1] Although the tonsilla palatina is morphologically unstable under pathological conditions such as inflammation and aging, the muscular composition of the tonsillar bed is thought to be unchanged.[2] This study was designed to evaluate histologically the presence and the proportion of mesenchymal tissue (skeletal muscle, cartilage, fat and bone), and seromucinous glands in routine tonsillectomy specimens.

Materials and methods

Our study included, archival materials of 1220 cases who underwent tonsillectomy because of hyperplastic tonsils, between 1990–2000, in the Pathology Department, Gaziantep University Medical Faculty. Haematoxylin-eosin (HE) sections of these cases were re-evaluated.

The amount of mesenchymal tissue (skeletal muscle, cartilage, fat and bone) and seromucinous glands were noted as focal, multifocal or abundant. The localization of tissues between hyperplastic lymphoid tissue was recorded.

Results

There were 567 male and 673 female patients. The age of patients ranged between one month and 73 years. Histological features (skeletal muscle, seromucinous glands, cartilage, fat tissue and bone) are shown in Table I.

TABLE I
THE INCIDENCE OF TISSUES OTHER THAN LYMPHOID TISSUE IN 1220 ROUTINE TONSILLECTOMY SPECIMENS

Tissue	Focal	Multifocal	Abundant	Total (Incidence)
Skeletal muscle	206	465	414	1085 (89%)
Seromucinous glands	236	134	59	429 (35%)
Fat	208	43	–	251 (21%)
Cartilage	31	–	–	31 (3%)
Bone	7	–	–	7 (1%)

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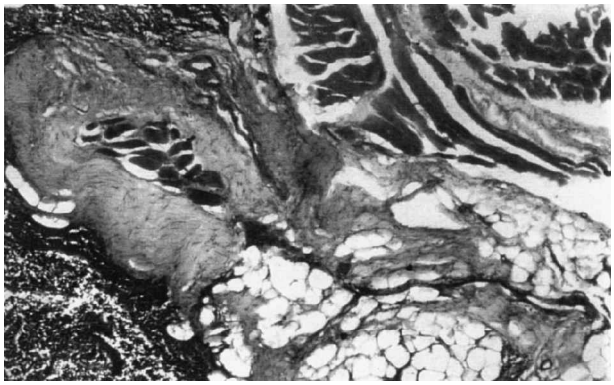


FIG. 1

Skeletal muscle fibrils and fat tissue are seen adjacent to lymphoid tissue (H & E: × 40).

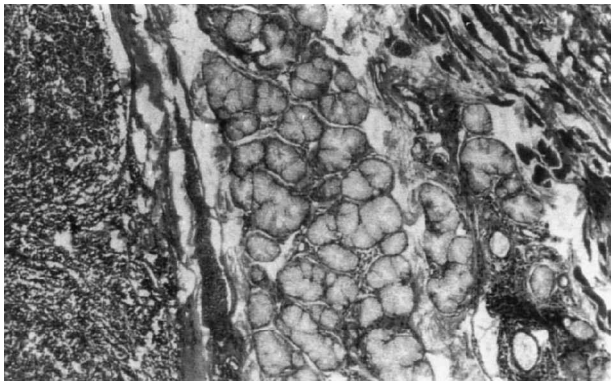


FIG. 2

Seromucinous glands and skeletal muscle fibrils are present in nearby lymphoid tissue (H & E: × 40).

The incidence of skeletal muscle was 89 per cent (1085 cases), seromucinous glands 35 per cent (429 cases), fat tissue 21 per cent (251 cases), cartilage three (31 cases), and bone one per cent (seven cases) (Figures 1 and 2).

Skeletal muscle in 165 cases (14 per cent) (Figure 3(a) and (b)), seromucinous glands in 12 cases (one per cent), cartilage in eight cases (one per cent) (Figure 4), fat in seven cases (one per cent), and bone in four cases (less than one per cent) (Figure 5) were found between hyperplastic lymphoid tissue in our study (Table II).

Discussion

The palatine tonsils are lymphoid tissues located in the fossa created by palatoglossal and palatopharyngeal muscles on both sides of the oropharynx.[3,4] In the embryonic development phase the epithelial lining of the second pouch proliferates and penetrates into the surrounding mesenchyme. By the third and fifth months, the tonsil is infiltrated by lymphoid tissue.[5] Stratified squamous epithelium covers the luminal surface and invaginates the tonsil, forming crypts. Tonsillar capsule is formed by the pharyngobasilar fascia, which sends branches of fibrous tissue into and around the tonsil. The connective tissue between the tonsillar capsule and the deeper superior constrictor muscle forms a plane of cleavage that facilitates surgical removal.[6]

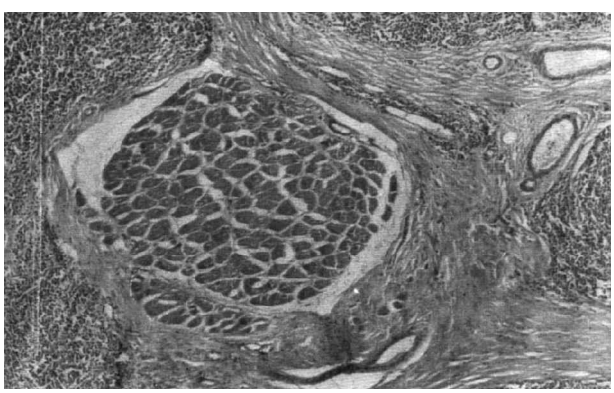
There is only one study, which indicates the incidence of skeletal muscle, seromucinous glands, and ectopic cartilage in tonsillectomy specimens, available in the literature. In this study Gnepp and Souther evaluated two groups of tonsillectomy specimens. Group 1 consists of 30 specimens evaluated on a retrospective basis. Group 2 includes 20 specimens, processed in a prospective manner.[1] Gnepp and Souther found the incidence of skeletal muscle 83 per cent (25 cases; three focal, nine multifocal, 13 abundant) in Group 1 and 100 per cent (19 cases; four focal, six multifocal, nine abundant) in Group 2, seromucinous glands 67 per cent in Group 1 (20 patients) and 80 per cent (16 patients) in Group 2. They found cartilage in one case in Group 1, and three cases in Group 2.[1]

Our study was larger and included tonsillectomy specimens from 1220 patients. The incidence of skeletal muscle was 89 per cent (1085 cases; 206 focal, 465 multifocal, 414 abundant). We found the

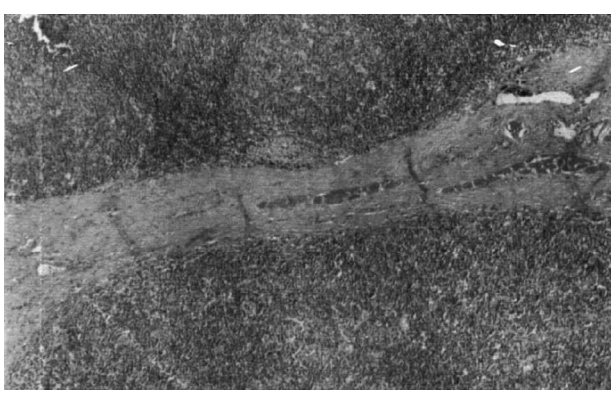
TABLE II

PROPORTION OF RECORDED MESENCHYMAL TISSUES AND SEROMUCINOUS GLANDS FOUND BETWEEN THE LYMPHOID FOLLICLES

Tissue	Number	%
Skeletal muscle	165	14
Seromucinous glands	12	1
Fat	7	1
Cartilage	8	1
Bone	4	<1



(a)



(b)

FIG. 3

(a) A large focus of skeletal muscle is seen between lymphoid tissue (H & E: × 40). (b) Tiny skeletal muscle fibrils are seen in fibrous bands between lymphoid follicles (H & E: × 40).

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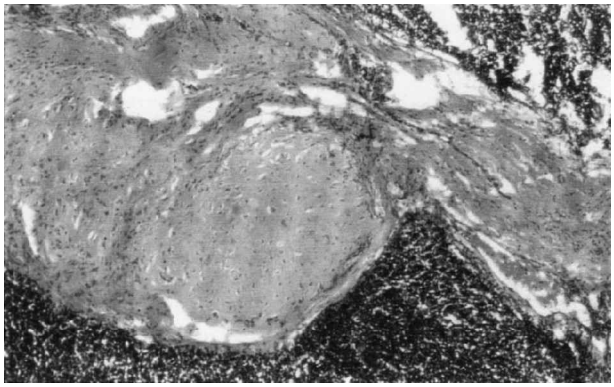

FIG. 4
This image shows a focus of cartilage surrounded by lymphoid tissue (H & E: × 40).

FIG. 5
The microphotograph reveals small amount of bone tissue between lymphoid follicles (H & E: × 40).

incidence of seromucinous glands 35 per cent (429 cases; 236 focal, 134 multifocal, 59 abundant). The incidence of cartilage was three per cent (31 cases), and eight of them were between the lymphoid tissue. Our study showed the incidence of fat tissue as 21 per cent (251 cases; 208 focal; 43 multifocal), seven of them were between the lymphoid tissue.

This study included archival materials, which were consisting of single, randomized sections from each tonsil. Some of these were not full thickness sections and not sufficient enough to evaluate the presence of skeletal muscle. Our skeletal muscle incidence is slightly higher than Gnepp and Souther's retrospective group (89 per cent versus 83 per cent). The skeletal muscle was found to be located deep or lateral to the hyperplastic lymphoid tissue in both studies.

We found the incidence of seromucinous glands 35 per cent (429 cases; 236 focal, 134 multifocal, 59 abundant). They were located deep to, or lateral to, the lymphoid tissue. Although Gnepp and Souther reported the presence of seromucinous glands with a higher incidence (72 per cent versus 35 per cent), no information was available about the amount of seromucinous glands in their study. They noted scattered small mature fat cells adjacent to the seromucinous glands. We observed fat tissue in 251 cases (21 per cent; 208 focal, 43 multifocal), seven of them were between the lymphoid tissue. In the article mentioned above, the authors reported that cartilage was associated with the seromucinous glands and never intermingled with the lymphoid tissue. The proportion of the cartilage located between the lymphoid tissue was found to be one per cent in our study.

Although lymphoid follicles were divided by thin fibrous bands, in some of the cases fibrous branches sent into the tonsil by the pharyngobasilar fascia showed remarkable thickening. With a larger study, we have been able to identify foci of bone in seven cases, four of them were located between the lymphoid tissue.

Conclusion

Mesenchymal tissues (skeletal muscle, cartilage, fat, bone) and seromucinous glands may be seen in different proportions in routine tonsillectomy specimens.

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