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FIBROSIS AND ADIPOCYTES IN WALL OF APPENDIX

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ABSTRACT

Introduction: Fibrous obliteration of appendix is known as neuroma and it is considered to be a reactive process. Appendices show atrophy of mucousa and lymphoid tissue and virtual replacement of the submucousa by fibrous tissue and fat.

Materials and Methods: In this retrospective study archived data, slides and blocks of appendix for the period January 2015 to August 2018 were retrieved. The H-E stained slides were examined. Those showing fibro-obliterative lesion with or without presence of associated adipocytes within the wall were sectioned and stained with Masson's trichrome stain. Further, those showing adipocytes were serial sectioned, H-E stained and examined to search for continuity of adipocytes to meso-appendicular fat.

Results: Of the 198 cases of appendix 41 cases (20.71%) showed complete or partial fibrosis; 12 cases (6.06%) showed complete fibrosis and 29 cases (14.64%) showed partial fibrosis. Partial fibrosis without any associated adipocytes was seen in 21.95% (9/41) cases. Partial fibrosis with associated adipocytes was seen in 48.78% (20/41) cases. Complete fibrosis without any associated adipocytes was seen in 4.88% (2/41) cases. Complete fibrosis without any associated adipocytes was seen in 4.88% (2/41) cases. Complete fibrosis without any associated adipocytes was seen in 4.88% (2/41) cases. Complete fibrosis with associated adipocytes was seen in 24.39% (10/41) cases. Serial sections did not reveal any continuity of the adipocytes within the wall with meso-appendicular fat.

Discussion/Conclusion: Mural fibrosis proceeds centrifugally from the submucousa. It is a reactive process. Adipocytes in the wall are a result of mesenchymal metaplasia.

Keywords: appendix, fibrosis, adipocytes, mesenchymal metaplasia.

INTRODUCTION

Fibrous obliteration of appendicular lumen is also known as neuroma. It is considered to be a reactive process, either as a part of aging or as a response to previous appendicitis. It is seen in approximately one third of excised appendices. The frequency if occurrence increases with age¹.

Appendices show atrophy of mucousa and lymphoid tissue and virtual replacement of the submucousa by fibrous tissue and $fat^{1,2}$.

Chronic appendicitis as an entity is considered controversial^{1, 2} though, evidence of active chronic inflammation, with infiltration of muscle coats and serosa by lymphocytes and plasma cells are suggested as criteria for histological diagnosis².

MATERIALS & METHODS

In this retrospective study archived data, slides and blocks of appendix for the period January 2015 to August 2018 were retrieved. The H-E stained slides

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were examined. Those showing fibro-obliterative lesion with or without presence of associated adipocytes within the wall were sectioned and stained with Masson's trichrome stain³. Further, those showing adipocytes within were serial sectioned, H-E stained and examined to search for continuity of adipocytes to meso-appendicular fat.

Of the 198 cases of appendix 41 cases (20.71%) showed complete or partial fibrosis; 12 cases (6.06%) showed complete fibrosis and 29 cases (14.64%) showed partial fibrosis.

RESULTS

Table 1 shows the gender distribution of complete and partial fibrosis, table 2 shows their age distribution and table 3 shows the numerical distribution of the degree of fibrosis and associated presence of adipocytes.

14.64% (29/198) of the cases showed partial fibrosis. The fibrosis varied from involving just the submucousa with sparing of the mucousa and lumen, to extending from the submucousa to the inner muscle layer with sparing of the outer muscle layer. 58.62% (17/29) of these cases were males. 34.48% (10/29) were in the age group of 21 - 30 years and 34.48% (10/29) in the 11 - 20 years age group.

Complete fibrosis of the appendix was seen in 6.06% (12/198) cases. 75% (9/12) of these cases were females. 33.33% (4/12) of these cases were in the age group of 31 - 40 years and 25% (3/12) of them in the age group of 41 - 50 years.

Partial fibrosis without any associated adipocytes was seen in 21.95% (9/41) cases. Partial fibrosis with associated adipocytes was seen in 48.78% (20/41) cases. Complete fibrosis without any associated adipocytes was seen in 4.88% (2/41) cases. Complete fibrosis with associated adipocytes was seen in 24.39% (10/41) cases.

Serial sections did not reveal any continuity of the adipocytes within the wall with meso-appendicular fat.

DISCUSSION

Fibrosis of the appendicular is considered as appendicular neuroma. Some also mention the additional presence of adipocytes². This phenomenon is thought to be a reactive process, either as a normal part of aging or as a response to prior acute appendicitis¹. A search of literature did not reveal any reference to the source of adipocytes in the appendicular wall when there is fibrosis.

In our study 20.71% of the received appendix specimens showed partial and complete fibrosis. In other studies fibrosis of varying degrees was seen ranging from 3% - 29% of received appendix specimen^{4, 5, 6}. Complete fibrosis was seen predominantly in females and partial fibrosis was seen in males (table 1). Together, partial and complete fibrosis showed a slight female predominance (21:20). Rios et al.⁷ described 8 cases with equal gender incidence. In contrast, Swayam⁶ found a male predominance.

Complete fibrosis was seen predominantly in 31 -50 years age group and partial fibrosis was seen predominantly in the 11 - 20 years age group (table 2). Swayam⁶ reported that majority of the cases of obliteration of lumen was seen in the age group of 21 - 40 years. Rios et al.⁷ reported an age range of 7 - 43 years with mean age of presentation of 27.8 ± 12 years. Both their findings are similar to ours.

Partial fibrosis without any associated adipocytes was seen in 21.95% (9/41) cases. Partial fibrosis with associated adipocytes was seen in 48.78% (20/41) cases. Complete fibrosis without any associated adipocytes was seen in 4.88% (2/41) cases. Complete fibrosis with associated adipocytes was seen in 24.39% (10/41) cases. Swayam⁶ found fibrosis and adipocytes in the appendicular wall but mention is made of the degree of fibrosis. Choi et al.⁸ reported a case of fibrosis along with the presence of adipocytes which purportedly had a focal wall defect on CT, histologically the wall defect was not evidenced but presence of adipocytes was confirmed.

In none of our cases could a defect in the appendicular wall be demonstrated and also serial sections did reveal any continuity of the mural adipocytes with that of meso-appendicular fat.

It is possible that mural fibrosis is reactive since most of the fibrosis in the early stages was seen in the submucousa (figures 1 and 2) with progressive increase spreading centrifugally to the muscle coats (figure 3 and 4). Since no continuity of the adipocytes could be demonstrated to the mesoappendicular fat the adipocytes are probably the result of mesenchymal metaplasia.

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CONCLUSION

Presence of mural adipocytes in the appendix is the result of mesenchymal metaplasia.

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Table 1: Gender distribution of complete and partial fibrosis

	Male	Female
Complete fibrosis	03	09
Partial fibrosis	17	12

Table 2: Age distribution of complete and partial fibrosis

	00-10 years	11-20 years	21 – 30 years	31-40 years	41-50 years	51-60 years	61-70 years	71-80 years
Complete fibrosis	00	01	02	04	03	01	00	01
Partial fibrosis	00	10	10	04	02	01	01	01

Table 3: Numerical distribution of degree of fibrosis and associated presence of adipocytes

Partial fibrosis without adipocytes	09
Partial fibrosis with adipocytes	20
Complete fibrosis without adipocytes	02
Complete fibrosis with adipocytes	10



Figure 1: H-E stained section of partial fibrosis of appendix (4x).



Figure 2: Masson's trichrome stained section of slide from figure 1(10x).



Figure 3: H-E stained section showing complete fibrosis of appendicular wall with adipocytes and chronic inflammatory cell (4x).

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