

A Retrospective Histopathological Analysis of Appendiceal Tumors for 10 Years

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Objective: To evaluate the incidence of appendiceal tumors in different sex and age groups.

Design: A Retrospective Study.

Setting: Pathology Department, Bahrain Defence Force Hospital, Bahrain.

Method: A retrospective review of 2,310 appendectomy specimens submitted to the Pathology Department between 1 January 2006 and 31 December 2015.

Result: During the study period, 2,310 appendectomy specimens were reviewed; 19 (0.8%) of the samples were histologically diagnosed as appendiceal tumors. Of the 19 appendiceal tumors, 9 (47%) were carcinoid, 6 (32%) were benign, including mucinous cystadenoma and neuroma and 4 (21%) were malignant. The mean age of carcinoid tumors is 35 years, ranging from 14 to 51 years. The mean age of malignant appendiceal tumors is 46 years, ranging from 30 to 60 years. Appendiceal tumors were found to be more common in males than in females. The male to female ratio is 2:1 for both carcinoid and benign tumors and 3:1 for malignant tumors.

Conclusion: Appendiceal tumors are rare. The most common tumors are carcinoid tumors. In some cases, an appendectomy alone is a sufficient treatment for a tumor. However, in cases of malignancy, a right hemicolectomy is required.

The sample included negative appendectomies where the histological examination established that the appendix was normal. The following data were documented: age, gender, diagnosis, tumor size, location and metastasis.

The WHO classification of appendiceal tumors was used to classify the tumors into carcinoid, benign and malignant. Two cases of mucocele of the appendix and eight cases due to incomplete clinical data were excluded from the study.

The data was analyzed using SPSS 19.0 statistical package. The Chi-Square test was used to compare categorical data whereby a P-value of <0.05 was considered significant. The continuous data generated was expressed in the form of mean and standard deviation while descriptive analysis of frequencies and percentages featured as part of the statistical analysis.

RESULT

Two thousand three hundred ten appendix specimens were documented; 1,456 (63%) were male and 854 (37%) were female with a male to female ratio of 1.7:1.

One hundred eighty-four (8%) appendices were normal, 1,857 (80.4%) were inflamed appendices and 19 (0.82%) were appendiceal tumors, 250 (10.8%) were lymphoid hyperplasia, fibrosis and fecalith. Nine (0.38%) of the appendiceal tumors were carcinoid tumors, 6 (0.25%) were benign tumors, and 4 (0.17%) were malignant tumors, see table 1.

Table 1: Incidence of Appendiceal Tumors

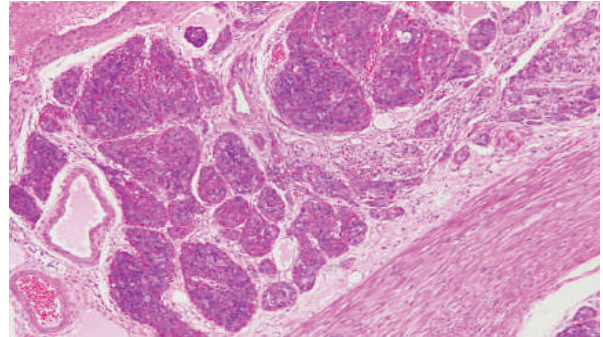


Figure 1 (A): Microscopic View of Carcinoid Tumor with Classical Arrangement of the Tumor Cells (H & E stained x10)

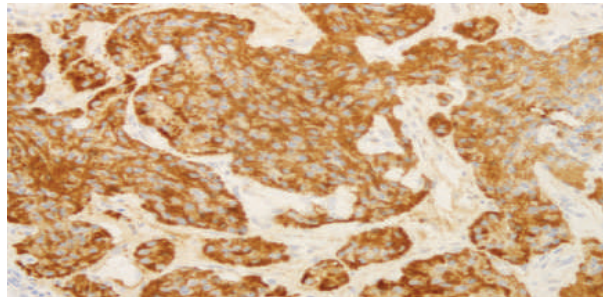


Figure 1 (B): Tumor Cells Stained Strongly for Chromogranin, a Special Immunohistochemistry Marker for Neuroendocrine Cells (Chromogranin Stain x20)



The mean age of the presentation of benign tumors was 38.8 years for both sexes; nonetheless, the average age for males is 33.5 years and 49.5 years for females.

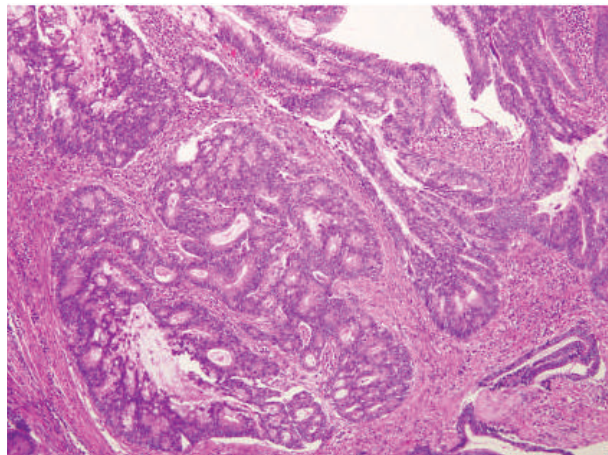
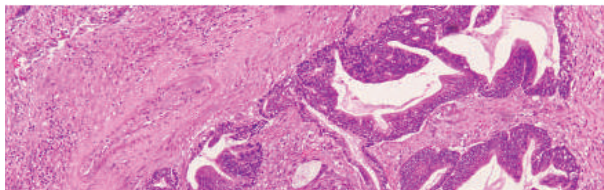


Figure 3 (A): Microscopic View of Adenocarcinoma of the Appendix: Low Power View of a Moderately Differentiated Adenocarcinoma Infiltrating the Wall (H & E x10)



rate of carcinoid tumors is equal in both sexes²⁵. In this study, males were twice more likely to be diagnosed with carcinoid tumors.

Carcinoid tumors in the appendix have a 2% to 4.7% chance of developing into malignancy and lower incidence of metastasis compared to other types of carcinoid growths that occur in the lungs, intestines, ovaries or kidneys²⁰⁻²³. In our study, one of the nine carcinoid tumors (goblet cell) metastasized; it was an aggressive adenocarcinoid tumor with carcinoid features, similar to other studies^{5,26}. Other studies revealed that the mean age of presentation of goblet cell carcinoid ranges between 52 and 59 years^{5,16}. In our study, this type of tumor was diagnosed in a 51-year old female.

A study by Roggo et al found that 78% of carcinoid tumors were located at the tip of the appendix; Another study by Lee et al found it to be 66.7%^{20,7}. On the other hand, goblet cell carcinoids mostly occur in the middle-third of the appendix¹². In our study, the average size of carcinoid tumors was 3.79 mm. A South Korean study reported an average size of 8.6 mm⁷. An appendectomy is an appropriate treatment approach for carcinoid tumors less than 1 cm to 2 cm in size^{11,13,20,21}.

Benign tumors are usually asymptomatic and account for about 0.2%. These abnormal masses are mostly found incidentally, similar to other appendiceal tumors¹¹. The most common type of benign tumor is mucinous cystadenoma. We found that mucinous cystadenomas occur in 0.2% of appendices compared to 0.4% to 0.6% in other studies^{7,27}. The treatment is total excision to avoid any malignant transformation and

mucinous cystadenoma is the most common benign tumor. Appendiceal tumors are slow-growing and are often detected before they grow large enough to metastasize. The most popular treatment approach is appendectomy. The data is not entirely reliable and cannot be used to present a solid conclusion regarding the relationship between appendiceal tumors, patients' age and gender. Nevertheless, the data in this study can be used for comparison purposes in future studies.

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Competing Interest: None.

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