Extragonadal Germ Cell Tumours in Males

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Abstract

Introduction: Extragonadal germ cell tumours are germ cell neoplasms located in extragonadal sites. These tumours have arisen from primordial germ cells misplaced during their migration to the gonads. The aim of this study was to determine the patterns of extragonadal germ cell tumours in University of Benin Teaching Hospital (UBTH) over a period of twenty years.

Materials and Method: This retrospective review involved all male cases of extragonadal germ cell tumours diagnosed during consultation in the Department of Morbid Anatomy, University of Benin Teaching Hospital from January 1, 1990 to December 31, 2010. The location, type and age were used to determine the patterns of extragonadal germ cell tumours in males. Permission for this study was obtained from the University of Benin Teaching Hospital (UBTH) ethics committee (protocol number ADM/E 22/A/VOL. VII/928).

Results: A total number of nine lesions were recorded during the period under review. Benign cystic teratoma constituted about 67%, immature teratoma 11%, poorly differentiated carcinoma 11% and embryonal carcinoma 11% of the entire diagnosis made. The observed lesions were distributed to the sacro-coccygeal region with majority occurring in young age.

Conclusion: Extragonadal germ cell tumours have been shown to be rare. Benign cyst teratomas were demonstrated to occur mostly in young males especially in the sacro-coccygeal region.

Key words: *extragonadal germ cell tumours, males, sacro-coccygeal, benign cystic teratoma.*

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Introduction

This entity which was first documented in the 19th century includes all germ cell tumours located in extragonadal sites.[1-3] Extragonadal germ cell tumours have been described as relatively uncommon and said to represent about 1-5% of all germ cell tumours.[4] The most widely accepted theory suggested that extragonadal germ cell tumours arose from primordial germ cells misplaced during their migration to the gonads.[5] Opponents of this theory have however argued that extragonadal germ cell tumours arose from germ cells with an aberrant path of migration from the yolk sac.[6] These tumours have been documented to occur in multiple midline locations particularly the retroperitoneum, anterior mediastinum, sacrococcyx, and the pineal gland.[7]The mediastinum has however been shown to be the most common anatomic site for extragonadal

germ cell tumour in adults with a male predominance.[4, 8] Since lesions occurring in some of these sites may not be available for surgical repair, only chemotherapeutic treatment may therefore be utilized in management of these cases.[9, 10] Fortunately, many extragonadal germ cell tumours have been shown to respond to treatment with common anticancer agents.[10, 11] Knowledge of the patterns of these lesions is important for adequate management.

Scanty studies have been conducted in our environment and these lesions have been recorded to respond well to appropriate chemotherapeutic agents and surgery.[12,13] This twenty year retrospective study was therefore aimed at determining the patterns of extragonadal germ cell tumours in the University of Benin Teaching Hospital in other to demonstrate the prevalence, types, site and age distribution of these tumours. This empirical study will no doubt prove very useful in managing patients with demonstrable germ cell tumours.

Materials and Method

Study design

This study was a retrospective review of all cases of histopathologically diagnosed extragonadal germ cell tumours reported in the department of Morbid Anatomy, University of Benin Teaching Hospital during a 20-year period commencing January 1, 1990 and ending December 31, 2010. Available sample slides were reassessed in most cases with exception of few cases were the slides were faded in which the tissue block had to be reprocessed for proper review. Parameters obtained included age, the location and tumour types which were used to determine the pattern of extragonadal germ cell tumour.[14]

Inclusion Criteria

Only extragonadal germ cell tissue samples with available and complete patient records, analysed in the pathology unit of the hospital were included.

Exclusion Criteria

Cases where tissue blocks could not be located in the departmental records unit for processing and analysis were excluded from this study.

Ethical Clearance

Approval for this study was obtained from University of Benin Teaching Hospital ethics committee PROTOCOL NUMBER ADM/E 22/A/VOL. VII/928 in accordance with Helsinki Declaration in 1995 (revised in Edinburgh 2000).[15]

Methods

Formalin fixed, paraffin embedded tissue samples, sectioned at 3-4μm and stained with haematoxylin-eosin, were carefully analysed for histopathologic features to further confirm initially documented patient results.[16] Their corresponding biodata was obtained from the patient records. Digital compound microscope (Brunel SP35 Digital, model: DN-107T, No: 000026 www.brunelmicroscopes.cp.uk, www.digital-microscopes.co.uk) was used to view and capture the slides.

Analysis of result

The percentage frequencies of the observed lesions of sites, types, age and behaviour were determined. The statistical package for the social sciences (SPSS) version 16 and Microsoft excel was used to analyse the data.[17] Tables and figures were used in this study.

Limitation of study

Cases where adequate clinical data could not be obtained or where original tissues blocks could not be found was excluded from this study

Results

A total of nine (9) extragonadal germ cell tumours were recorded during the period of study. Majority [6(67%)] of the cases were benign and they were all benign cystic teratomas (table 1). This tumour occurred in the first four decades of life especially in males below 10 years (table 2). The tumour was distributed in the following locations: omentum (1[11%]), periorbital regionList these in order of frequencies and include the absolute numbers and percentages. (2[23%]), sacrococcygeal (4[44%]), chest (1[11%]) and colon (1 [11%]). The lesion shown in figure A was composed of a cystic lesion lined by stratified epithelium whose lumen was filled with fluid and cell debris. In the wall was a loose connective tissues in which were clusters of sebaceous gland. are reactive fibroblast with large variably-sized vesicular nuclei.

APPENDIX 1

Table 1; Age distribution of extragonadal germ cell tumours in males.

Age Interval	BCT	IT	PD	EMB	TOTAL	%*f*
0-10	2	1	1		4	45
11-20	1				1	11
21-30	1				1	11
31-40	1				1	11
41-50						
51-60						
61-70						
71-80				1		11
81-90						
Unspecified	1					11
TOTAL	6	1	1	1	9	100

BCT: Benign cystic teratoma, IT: Immature teratoma, PD: Poorly differentiated teratoma, EMB: Embryonal carcinoma.

A case of embryonal carcinoma was recorded in the eighth decade of life (table 1). It accounted for 11% of the entire extragonadal germ cell tumours investigated and was localized to sacrococcygeal region. As shown in figure B and C, the lesion was composed of tubule-like structures disposed in a fibromyxoid connective tissue stroma. The tubules were lined by stratified columnar epithelium with the cells having an overlapping basophilic nuclei appearance with indistinct cell boundaries.

Similarly, a case of poorly differentiated carcinoma was seen in this study and it accounted for approximately 11% of the entire germ cell tumours investigated (table1). This lesion was seen in a 2 year old male and occurred in the sacrococcygeal region. (table2).

APPENDIX 2

Table 2; Site distribution of extragonadal germ cell tumours in males.

Sites	BCT	EMB	IT	PD	TOTAL	*%f*
Sacrococcygeal	1	1	1	1	4	44
Colon	1				1	11
Omentum	1				1	11
Chest	1				1	11
Periorbital	2				2	23
TOTAL	6	1	1	1	9	100

BCT: Benign cystic teratoma, IT: Immature teratoma, PD: Poorly differentiated teratoma, EMB: Embryonal carcinoma.

Only one case of immature teratoma was recorded (table 1) and it constituted 11% of the entire germ cell tumours investigated. This lesion was localized to the sacrococcygeum (table2) and the lesion, a section of the skin (figure D and E) showed a cystic region lined by cells with variable shapes. These cells had hyperchromatic round to oval nuclei and scant cytoplasm with indistinct cell membrane. The cells were invading the underlying stroma of the dermis. Also present are reactive fibroblast with large variably-sized vesicular nuclei.

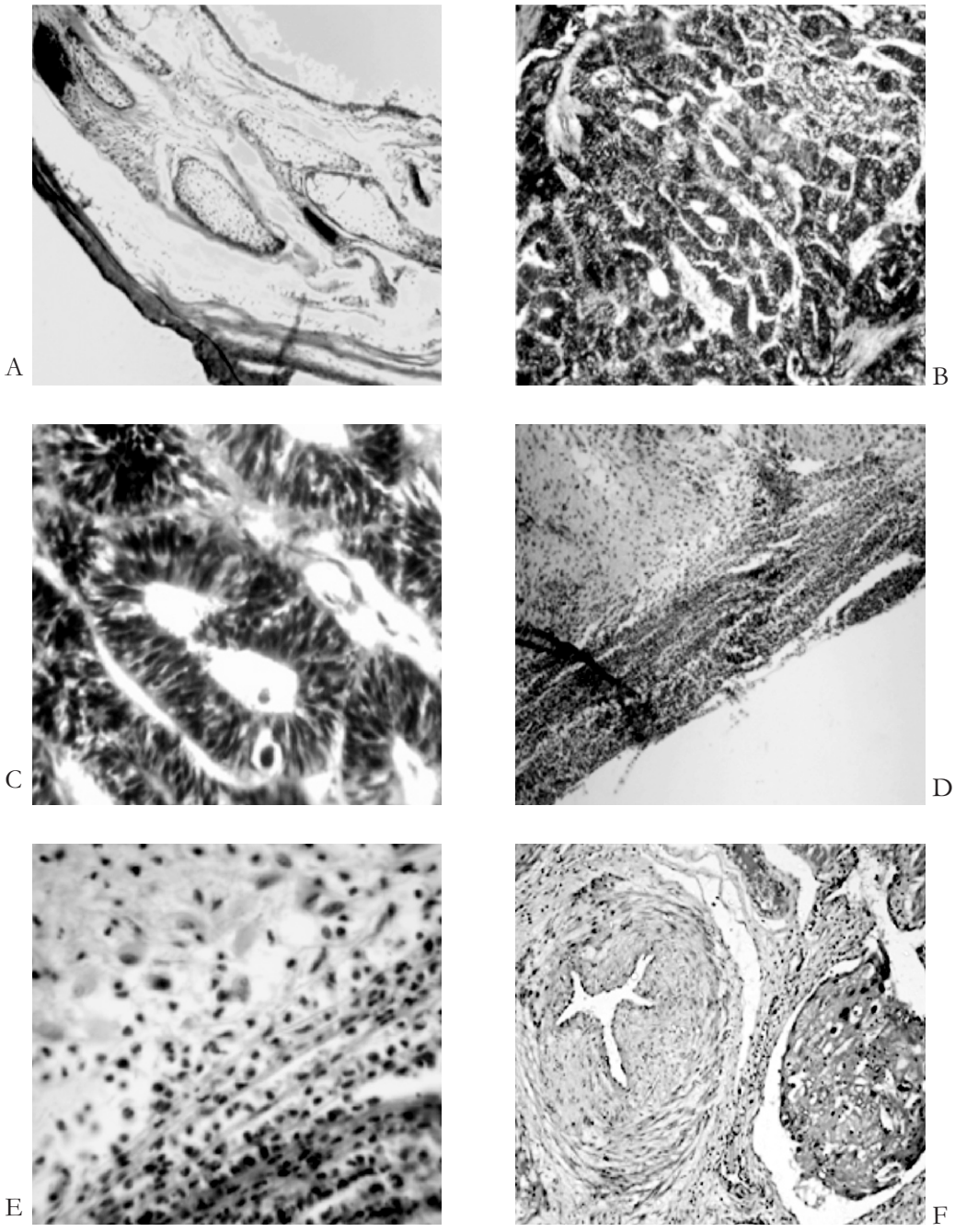

Figure 1; showing benign cystic teratoma (A), Embryonal carcinoma at 40 and 100 magnifications (B and C), Immature teratoma at magnification 40 and 100 (D and E), Choriocarcinoma in the uterus F (x 100).Figure A showing benign cystic teratoma with H &E x 100. Figure B showing embryonal carcinoma with H&E x 100. Figure C showing embryonal carcinoma with H&E x400. Figure D showing immature teratoma with H & E x 100. Figure E showing immature teratoma with H&E x 400.

Discussion

The study revealed that benign cystic teratomas were the most common extragonadal germ cell tumour in males. The observations in this report were also similar to the findings in India where benign cystic teratoma was recorded to constitute over half of the cases.[18] Another review in Zaria, Nigeria showed that a vast majority of the extragonadal germ cell tumours were benign cystic teratomas with immature teratoma responsible for the remaining few.[19] In the Indian and Zaria studies however, the findings were not separated into male and female groups which was the possible reason for their observations. The index study also showed that embryonal carcinoma, immature teratoma and poorly differentiated carcinoma accounted for the remaining extragonadal germ cell tumour.

The sacrococcygeal region was the most common site for extragonadal germ cell tumours in this study. These findings were similar to the observations in Zaria where the sacrococcygeal region was the most common anatomic site in males.[19] However in England, Arora et al. demonstrated that the central nervous system was the most common site for extragonadal germ cell tumours in males.[20] The English survey was however different from the review by Dehner, in 1990 and Stang et al.2007 in the United States of America who showed that the mediastinum was the most frequent site for extragonadal germ cell tumours in males.[21,22]

This study recorded age predominance within the first decade of life was however different from an American report where extragonadal germ cell tumours were seen to primarily affect men within the third to fourth decade of life.[23] Similarly in an American study, most of the extragonadal germ cell tumours occurred in the fourth decade.[24] The predominant affected age group in another research was within the first three decades of life.[21]

Conclusion

Extragonadal germ cell tumours have been shown to be rare. Benign cyst teratomas were demonstrated to occur mostly in young males especially in the sacrococcygeal region.

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