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Extra-Adrenal Retroperitoneal Ganglioneuroma

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Ganglioneuromas are benign tumors that originate from primordial neural crest cells. We report a retroperitoneal ganglioneuroma arising from the left paraspinal region. A twenty-year old woman presented with left lumbar pain. Neurological workup was normal. Imaging revealed a left paraspinal retroperitoneal mass measuring 9.74 x 6.19 x 4.30 centimeters. Complete surgical removal was uneventful. During follow-up, left lumbar pain improved and imaging showed no evidence of the disease.

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Ganglioneuromas consist of ganglion cells and Schwann cells[1]. These tumors originate from sympathetic ganglia, adrenal medulla and other sites[1]. Ganglioneuromas are classified under the neuroblastic group[2-4]. No specific signs and symptoms or cut points or markers for the diagnosis and the differentiation between the different neuroblastic tumors such as, neuroblastoma, ganglioneuroblastoma and ganglioneuroma. Therefore, histopathology and tissue investigation is important to confirm the diagnosis[5].

Ganglioneuromas are seen in children over 10 years of age and adults, commonly in posterior mediastinum and retroperitoneum[3,6,7]. A study reported 49 patients with ganglioneuroma, which showed equal distribution of the neoplasm in males and females[5]. Although it arises from the sympathetic nervous system, ganglioneuroma rarely leads to devastating symptoms caused by catecholamine synthesis[3,6]. Surgical resection is the main treatment and it has excellent prognosis[3,5,8].

The aim of this report is to highlight rarely seen case of neuroblastic tumor in Bahrain.

THE CASE

A twenty-year old woman presented with two weeks history of progressive left lumbar pain. No

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history of neurological deficits or any other systemic disease was found. Her past medical history was not significant and was not on any medication. Family history was not relevant. Physical examination showed no abnormalities.

Ultrasound of the abdomen showed a cystic mass in the left lumbar region measuring 9 x 5 cm. CT scan of the abdomen and pelvis confirmed the presence of a retroperitoneal mass measuring about 9.74 x 6.19 x 4.30 cm. The mass was located anterior to the lower pole of the left kidney and the left psoas muscle with its lower end reaching the opposite L5 vertebral body with clear line of cleavage between the mass and the surroundings. The content of the mass reads 31/34 HFU suggesting fluid of very high protein content, see figures 1 and 2.

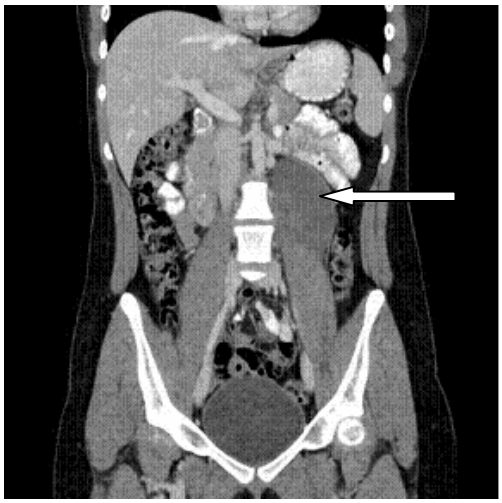

Figure 1

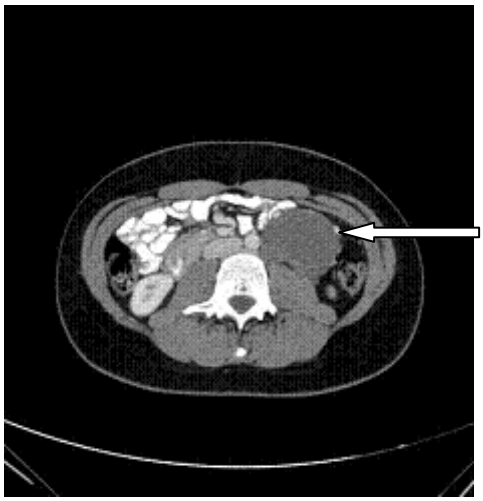

Figure 2

Figure 1 and 2: Axial and Coronal View of the CT scan of the Abdomen and Pelvis Showing a Well Circumscribed Mass in Left Lumbar Region Overlying the Left Psoas Muscle

The patient had exploratory midline laparotomy with complete excision of a solid lobulated well circumscribed grayish rubbery tumor weighing 138.7 grams and measuring 8 x 6 x 5.5 cm, see figure 3. The cut surface was smooth and golden yellow in color. No necrosis or hemorrhage noticed. Postoperative recovery was uneventful. Postoperative CT confirmed complete surgical excision.

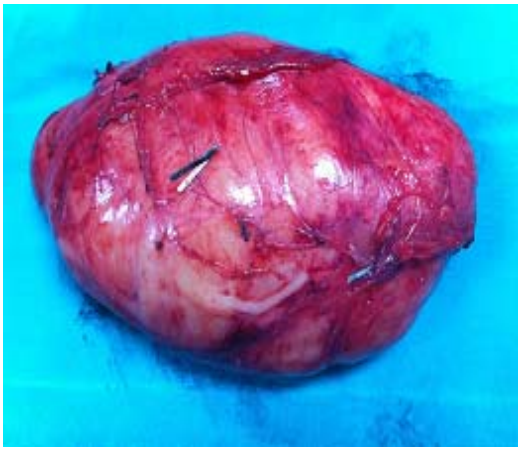

Figure 3: **Gross Appearance of the Resected Tumor Weighing 138.7 gm and Measuring 8 x 6 x 5.5 cm**

Histopathologic examination showed a neoplasm composed of spindle cells with wavy fibrillary cytoplasm (Schwannian rich stroma) arranged in bundles with focal myxoid areas and focal collections of ganglion cells (positive for S100 and synaptophysin) scattered in the Schwannian rich stroma. Foci of calcification were noticed. Scanty collections of small blue cells were noted, which were positive for LCA, but negative for S100, synaptophysin and neurofilament, confirming them as lymphocytes. There were no neuroblastic cells in the tumor. The excision was complete. The diagnosis was confirmed as ganglioneuroma; histologically was classified as favorable because it was Schwannian Stroma-dominant, see figures 4,5 and 6.

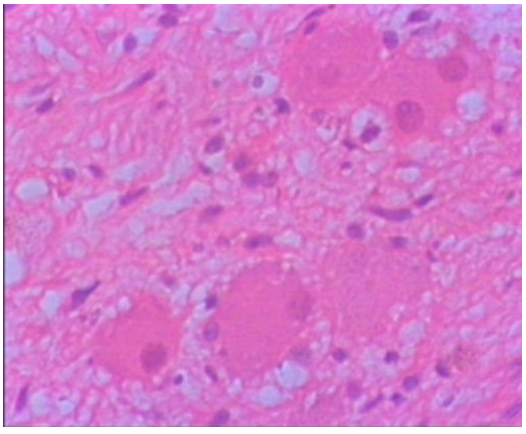

Figure 4: Photomicrograph of the Tumor Showing Schwannian Rich Stroma with Focal Collections of Ganglion Cells

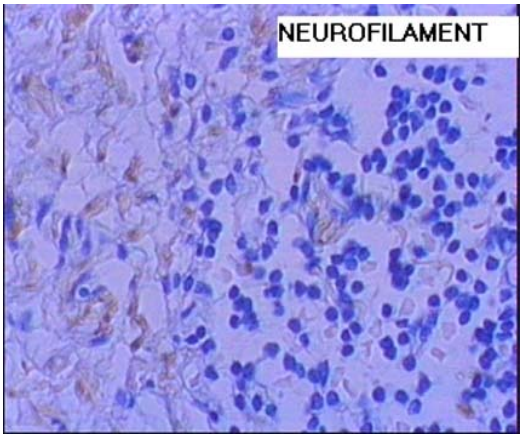

Figure 5: Photomicrograph of the Tumor Stained Positive with Immunohistochemical Marker for Neurofilament in the Schwannian Rich Stromal Cells

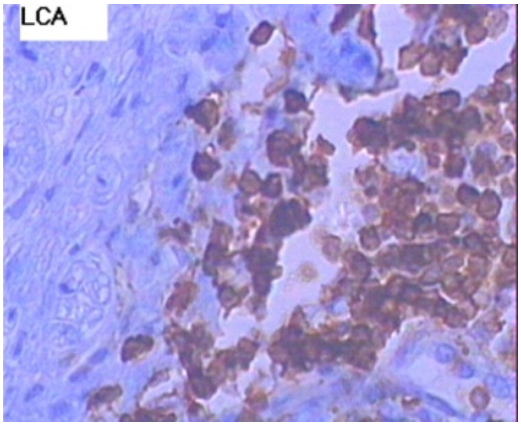

Figure 6: Photomicrograph of the Tumor Stained Positive with Immunohistochemical Marker for Leucocyte Common Antigen (LCA) in the Perivascular Lymphocytes

The CT scan staging of the chest, abdomen, pelvis and bone showed no evidence of metastasis. Vanillylmandelic acid in 24 hours urine was 19.4 umol/24 hours (n= 10-50 umol/24hours) and the urine volume was 0.6 L (n= 0.5-2.5 L). Hematological investigations with tumor markers results were within normal: B-HCG 0.10/L, CA 125 17.3 u/L (n= 0-35 u/L), CEA 0.7 ug/L (n= 0-4 ug/L), CA 19.9 9.8 u/L (n= 0-37 u/L) and alpha-fetoprotein 2.2 ug/L (n= 0-15.4 ug/L).

The final diagnosis was retroperitoneal ganglioneuroma; therefore, the patient needed no further radical therapeutic intervention.

DISCUSSION

Ganglioneuromas are rare benign slow growing neoplasm of neural crest origin[5]. It is classified under the neuroblastic tumors group; they arise from the sympathetic nervous system such as paravertebral sympathetic ganglia and adrenal medulla[4,6]. The most common sites of ganglioneuroma are the posterior mediastinum followed by the retroperitoneum as reported in

our case[7,9]. Ganglioneuromas constitute 0.72 to 1.6 of all the tumors located in the retroperitoneal space[9,10]. Primary ganglioneuroma evolves as a mature tumor de novo and secondary ganglioneuroma found during or after the treatment of neuroblastoma[5,7,9,11,12].

Ganglioneuroma remains silent for long period without causing any symptoms until it reaches a particular size in which it causes a pressure effect on adjacent structures leading to symptoms as presented in our case[7-9,12]. The clinical presentation depends on the size of the tumor, the location and whether catecholamines are secreted or not[10].

Levels of urinary catecholamines and its metabolites are usually within normal range in ganglioneuromas and frequently increased in neuroblastomas. However, few cases of ganglioneuromas were reported to have increased level of urinary catecholamines when measured. Therefore, histopathology studies are important in differentiating between the different neuroblastic tumors and reaching the definitive diagnosis[1,5].

Ganglioneuroma is solid firm tumor, gray white to yellow in color[1]. Microscopical findings of ganglioneuromas are of two subtypes, the first is made of a mature spindle cell tumor with Schwann cell fascicles and numerous ganglion cells as reported in our case. The second is a maturing subtype, which is similar to the first in its stroma but consists of ganglion cells of different maturation[7,13]. The presence of mature ganglion cells adds to the differential diagnosis and can differentiate between ganglioneuroma and other tumors, such as neurofibroma and meningioma; the presence of neuroblasts narrows the diagnosis between ganglioneuroblastoma and neuroblastoma[1,8].

Immunohistochemically ganglioneuromas are characterized by reactivity with S100 and neuronal markers such as NSE and synaptophysin in the ganglion cells. Schwannian rich stroma is positive for neurofilament and S100[7].

Since ganglioneuroma is a benign neoplasm, a complete surgical excision with preservation of organ function is adequate and no further adjuvant chemotherapy or radiation therapy is needed[8]. Chemotherapy or radiation therapy has no role in the management except in cases reported to have ganglioneuroblastic changes[7]. Furthermore, due to the release of catechlaminenergic peptides in some cases, hypertensive crises could occur during surgery[7].

Surgical removal of Ganglioneuromas results in a long-term disease free survival[8-10]. Local recurrence or metastasis could occur several years after the treatment[1,5]. Therefore, long-term follow-up is needed.

CONCLUSION

A large retroperitoneal ganglioneuroma causing pressure effect on the adjacent vertebrae was highlighted; the case was resolved completely after surgical resection.

Ganglioneuroma requires accurate diagnosis as this is rare entity. The surgical resection is the main treatment. The prognosis is excellent with a long-term disease free survival. The

patient needs close follow-up as local recurrence may occur even after appropriate treatment.

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