Spectrum of Teratoma: From Head to Toe, radiological pathological correlation.

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Learning objectives

Objectives:-

Teratoma by its various types is one of the common lesions facing the radiologists in their daily work. Our objectives in this educational exhibit are to:-

1. Discuss the embryologic origin and clinical features of terato-dermoid lesions in various locations.
2. Identify the radiologic characteristics of teratomas.
3. Describe the differences in radiologic features between mature, immature and malignant teratomas

Background

Teratomas (from Greek teratomeaning "a monster" and onkomameaning "swelling or mass") are germ cell tumors arising from pluripotent stem. By definition, it contains tissues from all three embryological layers e.g. endoderm, mesoderm and ectoderm.

Many theories about the origin of these tumors are reported. The most accepted evidence suggests that most are due to abnormal differentiation of embryonic germ cells that arise from the fetal yolk sac. Normally, these cells migrate to gonads yet it can migrate abnormally to other locations so there are gondal and extra gondal teratomas

Teratomas are usually found in the midline. The most common sites are: Sacrococcygeal - 40%, Ovary - 25%, Testicle - 12%, Brain - 5%, other (including the neck and mediastinum) - 18%.

By definition, teratomas include components derived from all 3 embryonic layers: ectoderm, endoderm, and mesoderm. These tissues are foreign to the location in which they are found.

In 1992, Tharrington and Bussen proposed following histologic classification for the congenital tumors.

1. Dermoids are neoplasm composed of only of ectodermal and mesodermal elements.
2. Teratoids contain ectodermal, mesodermal, and endodermal elements. These elements are however not well differentiated and lack clear organization.
3. True teratomas contain tissue derivatives from 3 germ layers. Cell layers demonstrate more organization.
4. Epignathi are the least frequent but most striking of teratomas in that well-formed organs and limbs may be found occurring in abnormal locations (e.g., an arm coming out of the oral cavity).

Teratomas range from benign, mature, well-differentiated cystic lesions to immature, poorly differentiated lesions with solid components and malignant transformation.

Classification of Teratomas is done based on the presence of immature neuroectodermal elements within the tumor. Mature tumors (grade 0) have no immature elements. In grade 1 tumors, immature elements are limited to one low-power field per slide; in grade 2 tumors, less than 4 fields are present per slide; and in grade 3 tumors, more than 4 fields are present per slide.

Teratoma with malignant transformation indicates the development of non-germ cell malignancies within a teratoma. Resection and chemotherapy were typically used.

With mature teratoma, sampling of the entire tumor is necessary to ensure that no immature neural elements or occult foci of malignancy are present. The pathologist should evaluate the tumor at 1-cm intervals. Also for the immature teratoma as the close histologic evaluation of immature teratomas reveals a good correlation between the degree of immaturity and the presence of microscopic foci of frankly malignant elements. These malignant elements are typically yolk sac tumors but may also represent primitive neuroectodermal tumor (PNET).

The prognosis and clinical outcome was reported to be related to the degree of tumor maturity, the risk of recurrence also appears to be related to the degree of immaturity. Recurrence in a completely resected mature teratoma is less than 10%; in an immature teratoma, recurrence may be as high as 33%. The likelihood of recurrence depends on the site of the tumor as well as the completeness of resection. It was suggested that the recurrence rate for immature teratomas can be decreased to 9.5% with chemotherapy. Sacrococcygeal teratomas are more likely to recur than those in the ovary or other sites.

**Findings and procedure details**

The typical imaging finding of teratoma is a cystic mass with intratumoral fat, calcification and soft tissue. So the radiological diagnosis of typical uncomplicated teratomas especially by CT and MRI is fairly straightforward. Although the dermoid and the mature teratoma are benign lesions, associated complications as torsion or rupture are considered as serious emergency. Also atypical location of teratoma is not uncommon. Immature and malignant types may not have enough fat or calcification. These factors
produce a diversity of radiologic findings and make prospective radiologic diagnosis difficult in many cases.

**Imaging Studies**

The role of radiological imaging in management of the teratoma is: - diagnosis, initial staging, monitoring the response to therapy and detecting relapse. Various modalities are appropriate at different points in the therapeutic course:-

- **CT** is the first modality in detection and staging of the abdominal and pelvic tumors at presentation. Also in the staging of other lesions. In case of malignant or immature lesions that need chemotherapy, CT is used in monitoring the therapeutic response. CT scanning is needed at relapse to determine the extent and location of the disease. CT chest, used in staging of abdominal lesion and in complete assessment of the thoracic primary tumor.
- **MRI** usually used in characterization of the intracranial, intraspinal and cardiac lesions. The pelvic MRI also used in ovarian cases.
- **Bone scanning** is a nuclear medicine test that is used to detect bony metastatic disease
- **US** is used mainly at the ovarian and testicular tumors, it aids in the detection of ovarian tumor spread and in monitoring certain masses without the risk of ionizing radiation.
- **Fluorodeoxyglucose (FDG) positron emission tomography (PET)** scanning appears to be most useful in the detection of relapse because other modalities cannot be used to detect the activity of the disease. The presence of elevated tumor marker levels, without the depiction of new disease on CT scans or MRIs, is an indication for FDG PET scanning.

1. **Sacro-coccygeal teratoma (SCT)**

A sacro-coccygeal teratoma (SCT) refers to a teratoma arising in the sacro-coccygeal region. The coccyx is almost always involved. It is the most common tumor of the fetus and the neonate. These tumors arise from totipotent somatic cells that originate from the primitive knot (Hensen's node) or caudal cell mass and escape normal inductive influences. The mature subtype is more common (70 %) than the immature one. SCT has a 4:1 female-to-male predominance.

The American Academy of Pediatric Surgery Section Survey classified the SCRT into 4 types according to its location:

- **Type I**: developing only outside the fetus (can have small pre-sacral component); accounts for the majority of cases.
- **Type II**: extra-fetal with intra-pelvic pre-sacral extension
- **Type III**: extra-fetal with abdomino-pelvic extension
- **Type IV**: tumour developing completely in the fetal pelvis
• Type 1 are usually identified at birth whereas type 4 are usually discovered later.
• SCT can diagnosed in utero as an incidental US finding, the value of prenatal diagnosis is to set appropriate plan for management. A teratoma larger than 5 cm is likely to cause dystocia and possible rupture; elective cesarean delivery should be performed. When the tumors are resected before the patient is aged 2 months, 7-10% is malignant. After that age, the risk of malignancy greatly increases to more than 50% by age one year.

**Imaging features:-**

**Plain radiogrpahy:** may show a large mass projecting from the lower pelvic region or within the abdominopelvic cavity and may show calcification

**CT:** shows the pelvic mass and can identifies bone, fat, calcified and cystic components. (Fig.1). The lack of calcification and fat content may raise the possibility of immature type, in these cases, the differential diagnosis of rabdomyosarcoma is considered. (Fig. 2)

**Ultrasound:** Mature types tend to be more cystic which show as anechoic components. Solid types (which are much rarer) often show an echogenic mass within the pelvis.

**MRI:** usually used in assessment of colonic displacement, ureteric dilatation associated hip dislocation, intraspinal extension, vaginal dilatation and metastatic assessment in malignant lesions.

These tumors usually exhibit heterogenous signal intensity with fat, calcification, cystic and solid components. **T2* GRE used to detect the calcification. The post contrast images are needed to assess the solid component.**

**Radiological differential diagnosis include sacral chordoma , terminal myelocystocele and the sacral meningocele. The totally intrapelvic lesion has other differential diagnosis including the neuroblastoma and rhabdomyosarcoma.**

The clinical outcome of such tumor is generally good yet there are some complication were reported as ureteric obstruction, gastro-intestinal tract obstruction , compression of underlying nerves : giving urinary / faecal incontinence, anaemia ,dystocia and tumor rupture

**2. Ovarian teratoma**

Ovarian teratomas are the most common germ cell neoplasm. The most common of these tumors, the mature cystic teratoma (also known as dermoid cyst).
**Ovarian dermoid cyst** and **mature cystic teratoma** are terms often used interchangeably to refer to the most common ovarian tumor. Although they have very similar imaging appearances, the two have a fundamental histological difference: dermoids are composed only of dermal and epidermal elements, whereas teratomas have mesodermal and endodermal elements.

Mature cystic teratomas account for 10-20% of all ovarian neoplasms. They tend to be identified in young women, typically around the age of 30 years and It is the most common ovarian mass in children.

**Clinically:** Most mature cystic teratomas are asymptomatic. Abdominal pain or other nonspecific symptoms occur in the minority of patients. They do however predispose to ovarian torsion, and may then present with acute pelvic pain. Mature cystic teratomas requiring removal can be treated with simple cystectomy. The tumors are bilateral in about 10% of cases presentation.

**Imaging features:**

**Plain radiography:** May show calcific and tooth components with the pelvis

**US:** is the modality of choice. The commonest picture is a cystic lesion with a densely echogenic tubercle (Rokitansky nodule) projecting into the cyst lumen (Fig 3). The second common picture is a diffusely or partially echogenic mass with the echogenic area usually demonstrating sound attenuation owing to sebaceous material and hair within the cyst cavity. The third common picture consists of multiple thin, echogenic bands caused by hair in the cyst cavity. Pure sebum within the cyst may be hypoechoic or anechoic. Fluid-fluid levels result from sebum floating above aqueous fluid, which appears more echogenic than the sebum layer. The dermoid plug is echogenic, with shadowing due to adipose tissue or calcifications within the plug or to hair arising from it. Diffuse echogenicity in these tumors is caused by hair mixed with the cyst fluid.

Numerous pitfalls have been described in the US diagnosis of mature cystic teratoma. Blood clot within a hemorrhagic cyst can appear echogenic, although a mature cystic teratoma usually demonstrates sound attenuation rather than increased through-transmission. Hemorrhagic cysts or blood clots typically demonstrate increased through-transmission. Echogenic bowel can frequently be mistaken for diffusely echogenic mature cystic teratoma and vice versa. Perforated appendix with appendicolith and fibrous lesions such as cystadenofibromas has also been described as false-positive findings.

**CT:** CT has high sensitivity in the diagnosis of cystic teratomas, though is not routinely recommended for this purpose in view of ionizing radiation. Typically teratoma demonstrates fat (areas with very low density), fat-fluid level, calcification (sometimes tooth), and tufts of hair. The presence of most of the above tissues is diagnostic of ovarian cystic teratomas in 98% of cases (Fig 4).
Some imaging feature may raise the suspicious of malignant transformation, these features include: - the size exceeds 10cms or soft tissue plugs and cauliflower appearance with irregular borders.

In case of rupture dermoid cyst, the hypo-attenuating fatty fluid can be found as ante-dependent pockets, typically below the right hemidiaphragm, a pathognomonic finding. The escaped cyst content also leads to a chemical peritonitis and the mesentery may be stranded and the peritoneum thickened.

**Pelvic MRI**: the MRI diagnosis of teratoma is straightforward one, usually tends to be reserved for difficult cases, but is exquisitely sensitive to fat components. The main differential diagnosis is endometriomas or other hemorrhagic cysts. Three methods can be used to distinguish the fatty contents of a mature cystic teratoma from endometriomas or other hemorrhagic cysts. Chemical-shift artifact in the frequency-encoding direction can be used to detect fat and distinguish it from hemorrhage. Gradient-echo imaging with an echo time in which fat and water are in opposite phase can demonstrate fat-water interfaces and mixtures of fat and water. Sequences with frequency-selective fat saturation will suppress the high signal of teratomas and help distinguish them from hemorrhagic lesions. MR imaging with this technique allows accurate differentiation between teratomas and hemorrhagic cysts and is preferable to the techniques described earlier. On the other hand, short-inversion-time inversion recovery sequences are not chemical shift-specific and therefore should not be relied on to distinguish hemorrhagic from fatty masses.

The Enhancement is also able identify solid invasive components, and as such can be used to accurately locally stage.

**Malignant degeneration of mature cystic teratomos a rare complication**, as refer to malignancy arising de novo in a preexisting benign mature cystic teratoma. But the immature teratomas are not known to arise from mature cystic teratomas. The most common malignancy in this setting is the squamous cell carcinoma arising from the squamous lining of the cyst (80% of cases) It has an imaging appearance that indicates the presence of the underlying mature cystic teratoma: a sebaceous lipid component as well as a heterogeneous solid component protruding into the cavity or extending transmurally into adjacent organs.

**Immature ovarian teratoma**

It is resemble the mature teratoma however it is much less common (<1% of ovarian teratomas), affect a younger age group (usually during the first 2 decades of life), histologically distinguished by the presence of immature or embryonic tissues and clinically by their more malignant behavior.

**Clinically: usually present with a palpable pelvic mass or less commonly with abdominal pain.**
**Imaging features**

Immature teratomas are typically large heterogenous mass with a prominent solid component. However, the spectrum of appearances ranges from a predominatly cystic to a predominantly solid mass. The cystic areas are usually filled with serous or mucinous fluid or may be filled with fatty sebaceous material. The tumors frequently demonstrate perforation of the capsule, which is not always well defined. Tumor grading is based on the amount of immature tissue present. Recently, the amount of yolk sac tumor within immature teratomas has been recognized as both the source of #-fetoprotein in affected patients and the major predictor of stage, grade, and rate of recurrence.

Immature teratomas are associated with mature cystic teratomas. Ipsilateral typical mature cystic teratomas are present in 26% of cases of immature teratoma, and an immature teratoma will be seen in the contralateral ovary in 10%.

Immature teratoma may metastasize to peritoneum, liver or lung. Metastasis to brain has also been reported. (Fig. 5).

**US:** a heterogeneous adnexal mass although is non-specific. Calcifications may be present.

**CT and MRI:** The presence of a prominent solid component containing calcifications and small foci of fat is suggestive. Cystic components may contain serous, mucinous, or fatty sebaceous material. Hemorrhage may be present (Fig. 5).

Immature teratomas are treated with chemotherapy. An interesting phenomenon that has been reported is chemotherapeutic retroconversion, where the teratoma or its metastasis post radiotherapy becomes more histologically mature than the primary lesion. Prognosis depends on stage. (Fig 5&6)

**Testicular tumors**

Testicular tumors represent only 1% of pediatric neoplasms. 10% of testicular tumors are teratomas. Pure testicular teratomas account for only 4 - 9% of all testicular tumors. Therefore, while teratoma is the second most common testicular tumor in male children, it is a rare neoplasm. It is more commonly found in very young children (< 2 years of age). The majority is unilateral yet isolated cases of bilateral testicular teratoma have been reported.

Clinically: testicular teratoma usually presented as a painless testicular mass.

**Imaging features**
US: the first modality for direct imaging in pediatrics. Teratomas are most often hypoechoic and inhomogeneous. They should be strongly suspected when both cystic areas and calcifications are seen within an intratesticular mass.

Mature teratomas tend to be cystic with heterogeneous echoes in the fluid representing a mixture of mucinous or sebaceous material with or without hair follicles. Solid components are present of variable echogenicity, including hyperechoic and shadowing fatty components. (Fig. 7).

Immature teratomas tend to be more solid, but still heterogeneous on account of areas of haemorrhage and necrosis.

CT: teratoma appears as an intratesticular mixed solid cystic lesion with calcification and fat spots (Fig. 8). CT is valuable in staging of the immature of the malignant cases, abdominal CT is required to detect the lymphatic deposits. The testicular lymphatics ascends along the gonadal arteries such that right-sided tumours involve pericaval nodes (aortocaval nodes, precaval nodes, and right paracaval and retrocaval nodes) whereas left-sided tumours typically ascend to pre-aortic and left para-aortic nodes.

Haematogeneous spread is typically to the lungs, as well as brain, bone and liver.

The differential diagnosis of prepubertal testicular tumors is limited. Germ cell tumors (eg, yolk sac tumor, teratoma) account for 70%-90% of these masses. The remainder comprises primarily Leydig and Sertoli cell tumors, leukemia, and lymphoma. Other pediatric testicular masses include metastases (eg, neuroblastoma, Wilms tumor, rhabdomyosarcoma,) gonadoblastoma, adrenal rests, lipoma, hematoma, and histiocytosis. Tuberculous orchitis can mimic hypoechoic tumors. US do not allow a specific diagnosis, although most primary tumors other than teratomas tend to be noncystic. Typically, intratesticular tumors are hypoechoic. However, they may appear as hyperechoic or isoechoic enlargement of the testicle.

Although rare, penile teratoma is reported, have the same criteria as the testicular one yet located at the root of the penis (Fig 9).

Retroperitoneal teratoma

Less than 10% of teratomas are found in the retroperitoneum. Teratoma accounts for as many as 11% of primary retroperitoneal tumors and is the third most common tumor in the retroperitoneum in children, after neuroblastoma and Wilms tumor. Teratoma is more common in females, with a bimodal age distribution (<6 months and early adulthood).

The diagnosis of a retroperitoneal teratoma is often made on the basis of investigative imaging. Retroperitoneal teratomas are predominantly cystic or completely solid in appearance.
US represent an important tool for making an early diagnosis and performing post-operative monitoring. CT or MRI are used to identify various components of these neoplasms, including soft-tissue density structures, adipose tissue and sebaceous and serous-type fluids. These imaging techniques are also able to indicate the precise location, morphology and adjacent structures of the tumor, enabling improved pre-operative planning and a more complete removal of the tumor with less damage. (Fig.10&11)

AFP is produced by malignant retroperitoneal teratomas and functions as a specific tumor marker for laboratory diagnosis. Abnormal elevations in serum levels of carcinoembryonic antigen (CEA) and carbohydrate antigen (CA)19-9 have been reported in primary retroperitoneal teratomas.

The differential diagnosis includes: other fat containing retroperitoneal lesion: lipoblastoma, liposarcoma, fat containing Wilms tumor.

Less commonly teratoma can located at the peritoneal region displacing the bowel loops all around. (Fig.12&13)

**Mediastinal teratoma**

Mediastinal teratomas account for about 15% of anterior mediastinal mass in adult and about 25% in children. They account for 50-70% of the mediastinal germ cell tumors. They occurs in a wide range of age, the mature teratoma is more common in adults whereas the immature ones are common in children below 1 year of age and may be detected antenatally. There is a slight female predilection; however immature teratomas occur almost exclusively in males.

Clinically, most of the cases are asymptomatic and may be discovered incidentally. Others are symptomatic related to the mass effect (respiratory distress (infants), Horner syndrome).

When the teratoma rupture occurs, it may present by chest pain, hemoptysis or respiratory distress.

**Imaging features**

The vast majority of mediastinal teratomas are located in the anterior mediastinum (80%), with most of the remainder involving multiple compartments (13 - 15%). Isolated posterior or middle mediastinal location is uncommon (2 - 8%).

Mature teratomas is usually appears as a large well-demarcated, displacing rather than invading adjacent structures, usually cystic with septal / rim contrast enhancement. It shows variable attenuation of fat, water density cystic spaces, fat-fluid levels (specific), homogeneous soft-tissue density and calcification. (Fig.14&15).
Immature teratomas are usually solid heterogeneous mass.

Differential diagnosis: mediastinal mass containing fat, e.g thymolipoma. Other mediastinal masses: other germ cell tumors and lymphoma

**Intra-spinal teratoma:-**

Spinal teratoma is an uncommon disease. The first case of this condition was described by Virchow in 1863. Spinal teratoma accounts for only 0.1-0.5% of all spinal tumors. It occurs at the intradural more than intramedullary location.

It may be associated with spinal dysraphism . the teratoma not associated with dysraphism is rare and is more common among infants and adolescents than among adults. The thoracolumbar region is reported as the most commonly affected, particularly in the area of conus medullaris. The clinical features, including weakness of the leg, sensory changes, and reflex abnormalities, are related to the location of the tumors.

**Imaging feature:**

- **Plain radiography** role is limited to detecting changes in the vertebral bodies, such as the erosion and widening of the interpedicular space due to the presence of a mass in the spinal canal, with or without vertebral abnormalities. Also may detect the internal calcification when large

- **CT** scan may show the classical appearance of teratoma (complex solid cystic lesion with calcification and fat content) (Fig 16)

- **MRI** is regarded as the gold standard diagnostic technique that can reveal the location of teratomas and, consequently, the degree of spinal cord involvement. The finding of mixed high- and low-intensity signals reflects the cystic and solid compositions of the tumor. (Fig 16).

**Intracranial teratoma**

They are uncommon intracranial neoplasms. It is uncommon tumor in general population. However it is the commonest fetal intracranial neoplasms. They can be divided into two broad categories, intra and extra-axial. The intra axial teratoma, located within the cerebral hemispheres, typically present either antenatally or in the newborn period. They are large tumours that increase head circumference and therefore often present with difficulty in child birth. They tend to more commonly supratentorially. Extra axial teratomas usually present in childhood or early adulthood and are typically smaller. They most commonly arise in midline., the pineal or suprasellar regions, the clinical presentation is usually due to mass effect obstructive hydrocephalus, Parinaud`s syndrome and optic chaisma compression etc...

**Imaging features**
As any teratoma, intracranial teratomas are often seen as large lesions with heterogeneous components. The majority of intracranial teratomas demonstrate some fat and calcification, which is usually solid / "clump like". They usually have cystic and solid components, contributing to an irregular outline. Solid components demonstrate variable enhancement. (Fig 17)

**Differential diagnosis:**

The intra-axial teratoma has a differential diagnosis of large mass in a neonate: - PNET, ATRT, Choroid plexus carcinoma.

The extra axial teratoma has a differential diagnosis of intracranial fat containing lesions as lipoma, dermoid and craniopharyngioma.

**Facial teratoma**

Teratoma of head and neck are very rare, it accounts for about 2-9% of all teratomas. They are partly undiagnosed at the time of birth. Diagnostic aids like CT scan and MRI shows anatomic relations of the tumor, extension and margins. Proper diagnosis is important before deciding on the operation.

The differential diagnosis of facial teratoma should include cystic hygroma, brachial cleft cyst (non calcified and cystic type) and rhabdomyosarcoma and hemangioma (are under calcified and mainly solid).

The prognosis of the facial teratoma is depending on site, size, histological grade and extension of tumor. The good prognosis is encountered when there is no intracranial or intra-orbital communication (Fig 18 & 19), on other hand the teratoma carries a mortality rate of 80-100% in which the tumor mass impinges on the airway.

**Images for this section:**
4 months female patient presented with presacral mass

A large ill defined complex cystic and solid mass lesion have an intra and extra pelvic component. Areas of fat density (arrow) and calcified foci are noted within (circle)

Pathological diagnosis. Mature teratoma

Fig. 1
2 months male patient presented with presacral mass

A huge ill defined complex cystic and solid mass lesion extending from epigastrium cranially down to sacral region and having extra pelvic component. No definite areas of fat density or calcified foci are noted within.

Pathological dx: Immature teratoma

Fig. 2
6 Year female patient presented with vague abdominal pain

Incidently discovered well defined adnexal cystic lesion with solid nodule seen within (arrow).

Pathological diagnosis
Mature cystic teratoma

Fig. 3
11 Year female patient presented with slowly growing pelvic mass

A large well defined complex cystic and solid mass lesion showing tiny foci of fat density (arrow) and notable calcified foci are noted within (circle)

Pathological diagnosis: Mature teratoma

Fig. 4
12 Year female patient presented with abdominal mass

A n ill defined predominately solid mass lesion occupying the pelvic cavity component. No definite areas of fat density or calcified foci are noted within Associated perihepatic deposit is noted

Pathological dx: Immature teratoma

Fig. 5
After chemotherapy

Newly developed notable calcific foci within the mass and within the prehepatic peritoneal deposit. Although the mass size increase and moderate amount of ascites appeared. Pleural deposit is also seen (arrow)

Fig. 6
4 years old boy presented with slowly growing scrotal mass

Large right testicular partially solid partially cystic heterogeneous mass containing calcifications.

Pathological diagnosis
Mature teratoma

Fig. 7
6 years old boy presented with painless scrotal mass

A well defined heterogeneous mass predominately cystic lesion is seen at the right testis showing areas of fat density (arrow) and calcified foci (circle)

Pathological diagnosis: Mature teratoma

Fig. 8
1 y male boy presented with penile swelling

A well defined heterogeneous solid and cystic mass lesion is seen at the root of penis showing areas of fat density (arrow) and calcified foci (circle)

Pathological dx:
Mature teratoma

Fig. 9
1 Year male patient presented with back swelling

An ill defined mixed cystic and solid mass lesion occupying the right lumbar region extending to the muscle of the back showing multiple calcified foci. No definite areas of fat density are noted within.

Pathological dx: mature teratoma

Fig. 10
2 month male patient presented with abdominal mass

An ill defined, predominately solid mass lesion occupying the abdomino-pelvic cavity. No definite areas of fat density or calcified foci are noted within.

Pathological dx: Immature teratoma

Fig. 11
1 years old male patient presented with slowly growing abdominal mass.

An ill defined large heterogeneous solid and cystic lesion is seen at the retroperitoneal region showing areas of fat density and calcified areas.

Pathological diagnosis: Mature teratoma

Fig. 12
9 month male patient presented with abdominal swelling.

Pathological dx: mature teratoma

An ill defined mixed cystic and solid intraperitoneal mass lesion displaying the bowel loops all around. It shows multiple calcified foci and areas of fat density are noted within.
11 Year male patient presented with dyspnea.

Pathological dx: mature teratoma

A well defined mixed cystic and solid mass lesion occupying the left upper hemi thorax causing shift of the mediastinal structures to the right side. It shows multiple calcified foci and areas of fat density are noted within.
13 Year male patient presented with incidentally discovered mass by X ray

A well defined mixed cystic and solid mediastinal mass lesion related to the pericardium. No mediastinal shift noted. It shows fatty and calcified foci.

Pathological dx: mature teratoma

Fig. 15
A well-defined mixed cystic and solid mass lesion occupying the right lumbar region extending to the muscle of the back showing multiple calcified foci. No definite areas of fat density are noted within.

Pathological dx: mature teratoma

Fig. 16
Fig. 17

A well defined sellar and suprasellar cystic lesion. It shows calcified foci at its inferior aspect (arrow).

Pathological dx:
matue teratoma
3 month girl presented with facial swelling

A huge well defined complicated cystic lesion extending from the level of mandible through the left orbit into the cranial cavity. It shows areas of fat and calcified foci.

Pathological dx: mature teratoma

Fig. 18
1.5 year old female patient presented with right check fullness

a rather defined right paraphyrngeal mass showing mixed fatty, calcific, solid and cystic components.

pathological diagnosis: mature teratoma
Conclusion

Awareness of the radiological picture of the teratoma all over the body organs, the reorganization of its complication and the differentiation between the different types are of utmost importance of the radiologists in their daily practice.

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References


