Case Report

Large Epignathus Teratoma: A Rare Case with Ominous Prognosis

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Abstract

Objective: The prevalence of epignathus teratomas is found to be less than 1% of all congenital teratomas. Incidence of female fetuses compared to male fetuses (ratio 3:1).

Method: This case study was conducted at Dr. Hasan Sadikin General Hospital Bandung between September - December 2022.

Case: We presented three cases of large epignathus teratoma with different complications each, with the same outcome, 2 cases of large epignathus teratoma were likely caused due to risk factors of poor environmental influence. The first case, large epignathus teratoma was referred with a suspicion of conjoined twin, the second case was accompanied by pulmonary tuberculosis with intracranial expansion, the third case was large epignathus teratoma with an Umbilical revered of end-diastolic flow and MCA absent end diastolic flow accompanied by scalp edema.

Conclusion: These three rare cases involve large epignathus teratomas, which have a poor prognosis due to the size and location of the mass, along with associated perinatal complications. It is crucial to establish a thorough and accurate diagnosis, develop an effective management plan, and ensure informed consent in these cases.

Keywords: Large epignathus teratoma, prognosis, outcomes, complications.

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INTRODUCTION

Teratoma in the facial region is an interesting case due to its unclear origin, bizarre microscopic appearance, varied morphology, and often dramatic clinical presentation.[1] The incidence of teratoma in the head and neck region is less than 5%, while in the facial area, it is 1.6%. [1-4] The frequency of epignathus teratoma occurrence is less than 1% of all congenital teratomas.[2,5] Epignathus teratoma cases are extremely rare, usually benign, congenital teratomas, and are rarely associated with other anomalies. Although teratomas can grow into the oral cavity, nasal cavity, and extend into the intracranial region, they typically protrude from the fetus or neonate's mouth. Teratomas are also referred to as pharyngeal teratomas, originating from the base of the skull, usually from the palate and mandible. The progression towards malignancy cannot be explained and is not well understood, but it has the potential to extend into the cranium and involve brain tissue.[6,7,13,15]

This case study reports three cases of epignathus teratomas found at the Fetomaternal Clinic of Hasan Sadikin Hospital in Bandung between September 2022 and December 2022. These were large, clinically aggressive epignathus teratomas based on imaging, and they represent rare cases with a poor prognosis.[7]

METHODS

This case study was conducted at Hasan Sadikin General Hospital Bandung between September - December 2022, 3 cases of large epignathus

teratoma were found through ultrasonographic examination performed at the Fetomaternal clinic of RSHS, which is a referral hospital from satellite hospital. All cases underwent ultrasound examination to identify suspected cases of large epignathus teratoma in the fetus. All the history, symptoms, and supporting examinations are included in the description. Consent was obtained by all participants in this study.

Case Presentation
Case 1

The first case was Mrs. N, a 26-year-old, presented to the Emergency Department of Hasan Sadikin General Hospital on September 12, 2022, with the primary complaint of abdominal discomfort. She was referred to the Fetomaternal Department of Hasan Sadikin General Hospital Bandung as a G2P1A0 patient at 23-24 weeks of pregnancy with suspected neck mass, possibly a conjoint twin, and premature contraction. During a previous examination by an obstetrician-gynecologist, it was discovered that the patient was carrying twins. There was no family history of twin pregnancy. The patient denied any history of living near factories, but she had previously worked in a textile garment factory for 8 years.

The fetomaternal ultrasound was identified a single intrauterine living fetus with the breech presentation in accordance with 23-24 weeks of gestation. The estimated fetal weight was 639 grams and fetal heart pulsations were present. A solid mass with some cystic components (hypo-hyperechoic) measuring 13.47 cm x 14.07 cm was observed in the facial area with no evidence of neovascularization. The amniotic fluid index measured 9.41 cm. The thorax (including heart structures) and abdomen were within normal limits. Umbilical and middle cerebral artery Doppler velocimetry were also normal.

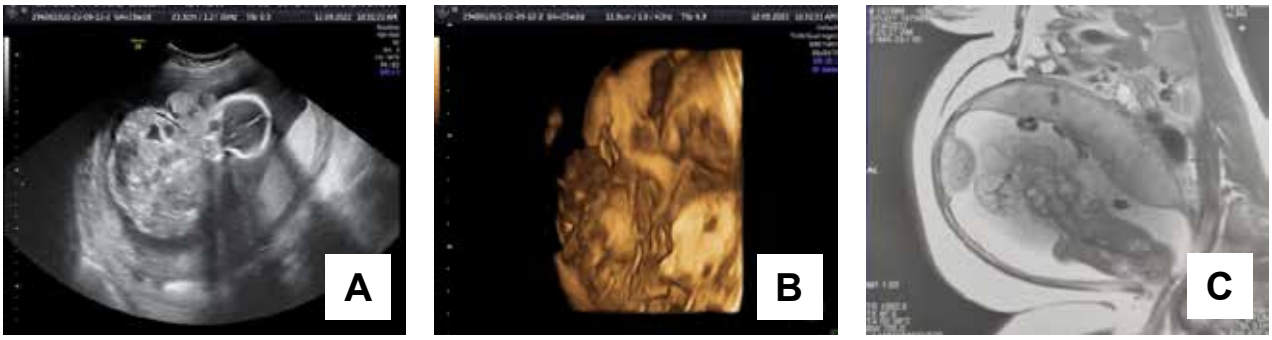

Figure 1 (A). USG 2D : A Solid Mass in Facial Area; **B. USG 4D** : A Solid Mass out of Oropharinx; **C. MRI**: A mixed solid-cystic mass, well-defined, with multiple lobulations, located in the facial area (nasal and extra-orbital regions), extending anteriorly in an exophytic and floating manner, suggestive of a teratoma (posibble immature).

On magnetic resonance imaging (MRI) examination, a well-defined, lobulated, mixed solid-cystic mass measuring 13.59 x 14.73 x 15.35 cm was identified, predominantly located in the facial region (nasal and extra-orbital), extending anteriorly in an exophytic and floating manner. This was suspicious for a teratoma (possibly immature) and was associated with polyhydramnios. There was no evidence of respiratory or gastrointestinal tract obstruction.

This case was discussed in a joint conference with radiologists and pediatric surgeons. Further follow-up was planned for the next 2 weeks. However, the patient delivered her baby one week later at Unggul Karsa Medika Hospital, Kopo. The patient was not referred to Hasan Sadikin General Hospital due to strong contractions, complete cervical dilation, and visible fetal legs, making it impractical for her to be transferred.

Case 2

Mrs. D, 25 years old came to the Hasan Sadikin Hospital High-risk Polyclinic on October 4, 2022, referred from Syamsuddin Hospital, Sukabumi with G4P3A0 20-21 weeks pregnant followed by pulmonary tuberculosis on antitubercular medication (2 weeks) and multiple congenital abnormalities. Patient had three times antenatal care at midwife and never went to obstetricians. The patient was hospitalized for 1 week at Syamsuddin Hospital, Sukabumi due to a history of coughing for 1 month and weight loss of 8 kg in 3 months. When admitted, an ultrasound was performed with gynecologist and it was suggested to be referred to the fetomaternal

clinic of Hasan Sadikin General Hospital. A history of working in a factory and living in a factory environment was denied.

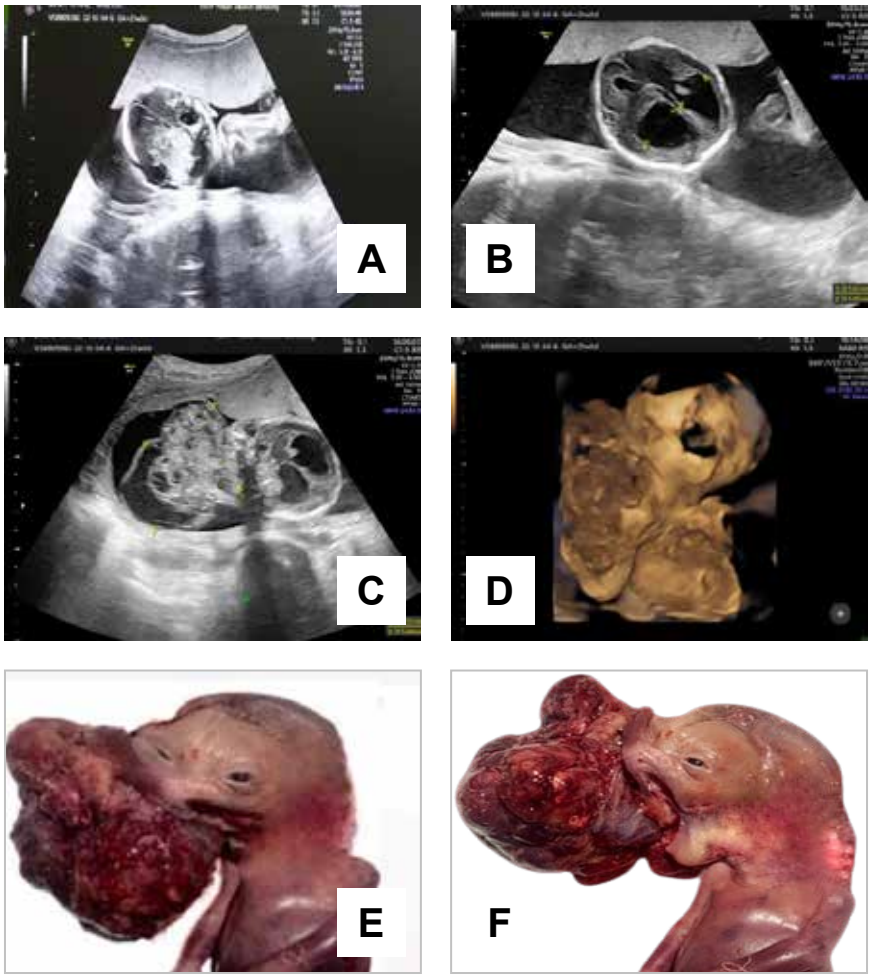

Figure 2 A. USG 2D: Solid mass with calcification in the lateral ventricle, suspicious of intracranial metastases of the mass; **B. USG 2D**: Severe ventikulomegaly; **C. USG 2D**: Solid mass with cystic part in the face; **D. USG 4D**: Solid mass with cystic part coming out of the oropharynx; **D**. Front View; **E**. Side View : Solid mass with cystic portion protruding from the oropharynx, coming from the palate.

Fetomaternal ultrasound showed a single live intrauterine fetus, located on the buttocks according to 20-21 weeks gestation with estimated fetal weight (EFW) 326 gr, fetal heart pulsation was positive. On the head, cerebellum, cisterna magna, cavum septi pellucidi and corpus callosum were difficult to assess, falx cerebri was positive, there was dilation of the right lateral ventricle with a size of 1.61 cm and left lateral ventricle with a size of 1.91 cm, suggesting ventriculomegaly. Solid, irregular mass with calcification at left lateral ventricle ± 3.5 cm, suspected epignathus teratoma with intracranial metastases. On the face,

nasal bone was positive but the nostrils and cleft were difficult to evaluate. A solid mass with partially cystic, irregular area on face measuring 7.51 cm x 5.69 cm (suspected oropharyngeal origin) with no neovascularization was seen. Amniotic fluid SDP (single deepest pocket) 7.27 cm. Thorax (cardiac structures) and abdomen within normal limits. Dopler velocimetry: umbilical artery and middle cerebral arterial (MCA) within normal limits.

On October 27, 2022 (3 weeks later), the patient complained of abdominal cramps and was delivered vaginally at Syamsuddin Hospital, Sukabumi. At the time of delivery, there was difficulty in delivering the head (head entrapment) but finally the baby could be delivered. A female baby with fetal weight of 600 g was born, stillbirth. A solid-cystic mass was seen coming out of the

oral cavity, the mass was further evaluated came from the palate.

Histopathologic examination was performed, the tissue samples consisted of ectoderm, mesoderm and endoderm components compatible with immature teratoma in the palate without any malignant features.

Case 3

Mrs. Y, 22 years old, came to the High-risk Polyclinic of Hasan Sadikin General Hospital on December 2, 2022, a referral from Hermina Arcamanik Hospital with G2P1A0 24-25 weeks pregnant, polyhydramnios, congenital abnormalities. The patient admitted that she had worked at a copper factory in Bandung Regency for 4 years (2018-2021), but had to quit because she was pregnant.

Fetomaternal ultrasound showed a single live intrauterine fetus, breech position was compatible with 24-25 weeks of pregnancy with EFW 736 gr, fetal heart pulsation was positve. On the head, cerebellum according to 24 weeks, scalp edema size 5.9 mm. On face, nasal bone was positive but nostrils and cleft difficult to evaluate. There was a heterogeneous echo density mass (solid with cystic part) at face measuring 11.18 cm x 13.14 x 14.19 cm with neovascularization (-). Amniotic fluid SDP 10.90 cm. Thorax (cardiac structure) and abdomen within normal limits. Doppler velocimetry: umbilical artery appeared to be revered at end diastolic flow and MCA appeared to be absent at end diastolic flow.

Considering the condition of the fetus, vaginal termination with induction of labor was recommended. Three days later, a baby girl was born, birth weight 300g, stillbirth. A solid cystic mass was seen coming out of the oral cavity, the mass was further evaluated came from the palate. The mass that came out of the oral cavity was fragile and cystic so the mass was loose.

For the mass, histopathological examination was performed, it was found that the tumor mass consisted of ectodermal, mesodermal and endodermal components, the ectodermal component was compatible with immature teratoma at palate without any malignancy features.

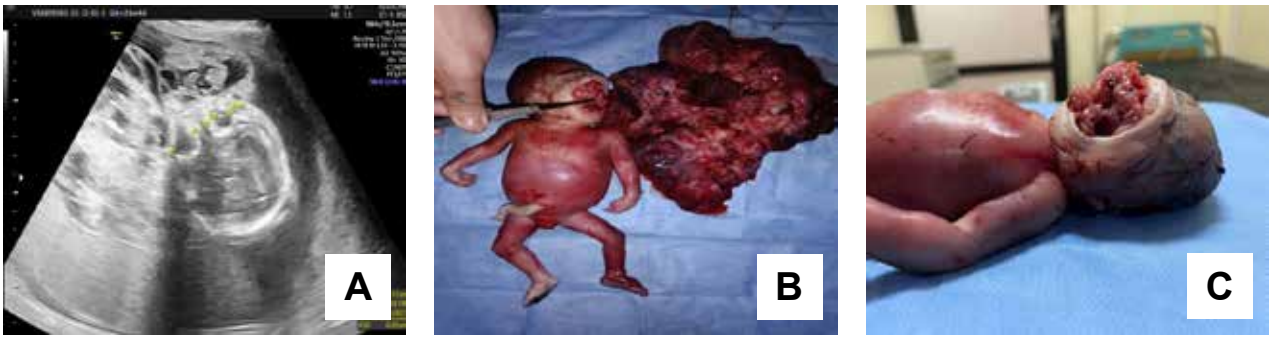

Figure 3 A. USG 2D: Mass with heterogeneous echo density (solid with cystic parts) on the face; **B & C**. There is a solid mass with some cystic discharge from the oropharynx, which originated from the palate, but the mass appears to be dislodged from the oropharynx during labor.

DISCUSSION

The incidence of cases of epignathus teratoma attached to the skull base is very rare, as it is usually attached to the hard palate and mandible. The average incidence is 1 in 35,000 - 200,000 live births.[2,8,9,12,13] Other literature states that the frequency of epignathus teratoma is less than 1% of all congenital teratomas.[2,5] The incidence is more in female fetuses than male fetuses (ratio 3:1).[2,9] However, at Hasan Sadikin General Hospital we found 3 cases in the last 4 months (September-December 2022). The patients were born at 24 weeks gestation with female gender (except the first case, we did not obtain birth data). The maternal age in these cases ranged from 22-26 years with an average age of 24 years in accordance with the literature.[10]

The etiology of epignathus teratoma remains unclear.[9] The most common theory is that epignathus originates from pluripotent cells in the Rathke pouch that grow irregularly. [6,11,12] There is literature that mentions the association of epignathus with duplication of the hypophysis gland. Sporadic chromosomal changes have also been reported. But usually epignathus is not associated with chromosomal aberrants.[2] The risk of chromosomal abnormalities is very low in fetus

with teratomas.[3,12] From other literature, there is no evidence to suggest epignathus is caused by environmental agents, mendelian or polygenic inheritance or abnormal chromosomes. In this literature, no report of epignathus recurrence in a family has been reported.[2] In this case, from the history, it was found that the patients in the first and second cases had a history of working in factories. The first patient worked as a garment textile factory laborer for 8 years while the third patient had worked in a copper factory for 4 years from 2018-2021. So the possibility of environmental exposure cannot be ruled out. We have summarized the three cases in table 1.

Epignathus is a mass that fills the oral cavity and can protrude externally, distorting facial anatomy and often causing airway obstruction at birth.7 Mortality rates associated with large teratomas in the head and neck are generally high and without the need to prepare a good resuscitation team or plan to secure the airway at birth because most large teratomas can obstruct the airway and make intubation difficult.[7,9,13] Prognostic factors depend on the location and size of the tumor and are associated with perinatal complications.[3,14] Prognostic factors should also be considered in order to make a decision of choice of the next management plan.[2] In these three cases, the teratoma was large enough to distort the facial anatomy, making intubation or removal of the tumor impossible due to poor prognosis, and the risk of stillbirth at birth. In patients with large epignathus teratoma with poor prognosis, vaginal delivery is considered, but in this case, the average patient was born at 24 weeks with breech presentation. Sometimes teratomas with more solid components can make it difficult during the vaginal delivery process. It is recommended to terminate the pregnancy before 24 weeks because the smaller the gestational age the better and easier the vaginal delivery.

Teratomas can be detected early with antenatal ultrasound and are usually found during the second trimester. From the literature the sensitivity of ultrasound to identify fetal teratoma, sensitivity rate is 100%, specificity rate is 96.7%, positive prediction value rate is 83.3 and false positive rate is 3.3%.[3] The use of MRI also has the benefit of not using radiation.The disadvantage of MRI is that it requires a long examination.[7] However, considering that MRI examination is expensive in Indonesia, diagnosis can also be done only with ultrasound although this also depends on the examiner's skill.

Differential diagnosis of masses in the oral cavity includes congenital epulis teratoma, lymphatic malformation hemangioma, dermoid cyst, benign or malignant soft tissue mass (teratoma of tongue). Parasitic twin syndrome has also been reported in this location.[2,8] The first patient was referred with suspected conjoined twin. Epignathus teratoma is also often missed diagnosis with parasitic twin syndrome. However, the literature states that fetal teratoma originates from pluripotent cells forming irregular conglomerates of mature or immature tissue, tends to lead to malignancy and is usually very easy to distinguish from pregnant monozygotic twins. In monoamniotic or acardius acranius twins, there are two umbilical cords associated with blood vessels on the surface of the placenta. Incomplete separation of monozygotes leads to conjoined twins. Usually this form is not accompanied by the appearance of congenital abnormalities.[6]

Table 1. Summarize 3 cases

	Case 1 (Mrs. N/ 26 y.o)	Case 2 (Mrs. D/25 y.o)	Case 3 (Mrs. Y/22 y.o)
Refferal Diagnosis	G2P1A0 23-24 weeks pregnant, mass suspected a/r colli dd/ conjoint twin and premature contraction	G4P3A0 20-21 weeks pregnant; Pulmonary tuberculosis on OAT therapy (2 weeks) and congenital anomaly suspected fetal head tumor	G2P1A0 24-25 weeks pregnant polyhydramnios, congenital anomaly
Working History	Work at Garment textile factory for 8 years	Never worked in a factory or lived near one.	Work at a copper factory for 4 years from 2018-2021, but quit due to pregnancy
USG Examination	Breech lie, biometry equal to 23-24 weeks pregnant, EFW 639 gr, FHR (+). A solid, partially cystic (hypohyperechoic) mass, size 13.47 cm x 14.07 cm a/r face	Breech lie, biometry equal to 20-21 weeks pregnant, EFW 326 gr, FHR (+). Breech lie, biometry equal to 20-21 weeks pregnant, EFW 326 gr, FHR (+).	Breech lie, biometry equal to 24-25 weeks pregnant, EFW 736 gr, FHR (+). Heterogeneous echo density mass (solid with cystic portion) a/r face size 11.18 cm

	with no neovascularization. Amnion SDP 9.41 cm Doppler Velocimetry: normal	Head: Dilation of the right lateral ventricle size 1.61 cm and left lateral ventricle size 1.91 cm. Conclusion : ventriculomegaly. Solid, irregular mass with calcification a.r left lateral ventricle size ± 3.5 cm, suspected epignathus teratoma with extension to intracranial. Solid mass, partially cystic, irregular a/r face size 7.51 cm x 5.69 cm (suspected oropharyngeal origin) with no neovascularization. Amnion SDP 7.27 cm Doppler Velocimetry: normal	x 13.14 x 14.19 cm, with no neovascularization . Amnion SDP 10.90 cm Doppler velocimetry : A umbilical appears to have *reversed of end diastolic flow* and MCA appears to have *absent end diastolic flow*
MRI Examination	A solid-cystic, well-demarcated, multiply lobulated, mixed mass measuring 13.59 x 14.73 x 15.35 cm that appears to be facial (nasal and extra orbital region) and anteriorly extending exophytically and floating e.c. suspected teratoma (immature?) with polyhydramnios. There was no obstruction of the respiratory tract and gastrointestinal tract.	MRI was not performed	MRI was not performed
Labour	Spontaneous vaginal birth at Unggul Karsa Medika Hospital, Kopo Born baby, stillbirth	Spontaneous vaginal delivery Born baby girl, birth weight 600 gr, stillbirth. At the time of birth, there was difficulty in delivering the head (head entrapment) but eventually the baby could be delivered	Vaginal Termination: induction of labor Born baby girl, BW:300 gr, stillbirth.
Post Partum	No data	A solid-cystic mass is seen coming out of the oral cavity originating from the palate	A solid-cystic mass is seen coming out of the oral cavity originating from the palate. The mass is fragile and cystic and can easily fall off
PA Examination	No data	Tissue composed of ectoderm, mesoderm and endoderm elements correspond to immature teratoma of the palate without any malignancy elements	The tumor mass consists of ectodermal, mesodermal and endodermal components. The ectodermal component corresponds to an immature teratoma of the palate without any elements of malignancy

In the second case, Epignathus teratoma was accompanied by intracranial extension (solid mass in the choroid plexus) resulting in severe ventriculomegaly. The literature states that epignathus teratoma is not known to be malignant but can potentially expand into the head and involve the brain.[7] Cases with intracranial expansion cause brain tissue damage and have a very poor prognosis, generally fatal.[2,10] In addition, the patient also had TB on therapy for 2 weeks (when the ultrasound examination came) and was underweight, so this could be a trigger for preterm labor and infant mortality.[14]

In the third case, there is scalp oedema with umbilical artery showing reverse of end diastolic flow and absent end diastolic flow of MCA. The baby was stillbirth with a weight of 300 gr, with the impression of intrauterine growth restriction.

The possibility of the baby is not viable due to the compression or pressure of a large mass on the surrounding organs causing scalp oedema and decreased blood flow so that the doppler is obtained in the MCA and umbilical artery decreased.

The two reported cases of large epignathus teratoma may be associated with poor environmental risk factors of prolonged exposure to heavy metal waste since before pregnancy, but further research is needed on the environmental conditions associated with this condition.

The histopathology results for cases 2 and 3 showed that the tumor mass consisted of ectodermal, mesodermal and endodermal components. These findings did not explain the malignancy although immature neuroectodermal elements were present. The literature states that overall neuroectodermal elements (either mature or immature) are more commonly found in the neck and head. [9,13,15] The presence of some immature neural tissue associated with teratoma does not improve the prognosis.[13,14]

CONCLUSION

These three rare cases involve large epignathus teratomas, which have a poor prognosis due to the size and location of the mass, along with associated perinatal complications. It is crucial to establish a thorough and accurate diagnosis, develop an effective management plan, and ensure informed consent in these cases.

ETHICAL APPROVAL

This study does not require an ethical approval as determined by the institutional and departmental review board

CONSENT

Consent was obtained by all participants in this study.

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