CASE REPORT

1. National Institute of Perinatology, Mexico City, Mexico
2. Universidad de Sonora, México
3. National Institute of Medical Sciences and Nutrition, Salvador Zubirán, Mexico
   a. Gynecology and obstetrics department
   b. Adolescence department
   c. Nutrition department
   d. Internal medicine department

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Corresponding author:
Dra. Cintia María Sepúlveda Rivera MD
Gynecology and Obstetrics Departament, Instituto Nacional de Perinatología, Ciudad de México, Mexico
Calle Montes Urales 800, Lomas - Virreyes, Lomas de Chapultepec IV Secc, 11000 Ciudad de México
+52 (64) 49 979908
cintiia_sepulveda@hotmail.com

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Sarcomas in pregnancy: Report of two cases and literature review

Sarcomas durante el embarazo: reporte de dos casos y revisión de la literatura

Francisco Ibargüengoitia-Ochoa[1,a], Josefina Lira-Plascencia[1,b], Fabiola Gallardo-Gómez[1,a], Carlos Rubén Mustre-Juarez[1,a], Sergio Sepúlveda-Rivera[2,c], Arturo Maximiliano Ruiz Beltrán[3,d], Cintia María Sepúlveda Rivera[1,a]

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ABSTRACT

Objective: To present the perinatal results of two patients diagnosed with Ewing's sarcoma and alveolar rhabdomyosarcoma. Methodology: Two cases of patients with a diagnosis of sarcoma treated at the National Institute of Perinatology in Mexico City were reviewed. Results: Case 1, a 22-year-old female, with a 23.0-week pregnancy and a 20-cm tumor in the left gluteal region, pain and difficulty walking. The chest radiograph revealed multiple pulmonary nodules and the magnetic resonance imaging revealed a tumor in the gluteal region with extensive involvement. The diagnosis was stage IV metastatic Ewing sarcoma. Management consisted of symptomatic treatment with resolution of the pregnancy at 28 weeks. Case 2, a 22-year-old female with a 12.0-week pregnancy and a diagnosis of metastatic spinal cord syndrome. T9-11 decompression was performed. Absence of fetal heart rate was evidenced, so medical management of deferred abortion was performed.
Key words: Pregnancy, Ewing Sarcoma, Rhabdomyosarcoma.

RESUMEN

Objetivo. Presentar los resultados perinatales de dos pacientes con diagnóstico de sarcoma de Ewing y rabdomiosarcoma alveolar. Metodología. Se revisaron dos casos de pacientes con diagnóstico de sarcoma atendidas en el Instituto Nacional de Perinatología de la Ciudad de México. Resultados. Caso 1 femenino de 22 años, con embarazo de 23,0 semanas y tumoración en región glútea izquierda de 20 cm, dolor y dificultad para deambular. La radiografía de tórax informó múltiples nódulos pulmonares y la resonancia magnética, tumor en región glútea con compromiso extenso. El diagnóstico fue sarcoma de Ewing metastático en etapa IV. El manejo consistió en tratamiento sintomático con resolución del embarazo a las 28 semanas. Caso 2 femenino de 22 años con embarazo de 12,0 semanas y diagnóstico de síndrome medular metastásico. Se realizó descompresión T9-11. Se evidenció ausencia de frecuencia cardiaca fetal, por lo que se realizó manejo médico de aborto diferido.
Palabras clave. Embarazo, Sarcoma de Ewing, Rabdomiosarcoma.

Introduction

The association of cancer and pregnancy is rare, with an incidence of 1 in every 1 000 pregnancies, with breast cancer, melanoma, cervical cancer, lymphomas and acute leukemia being reported in order of frequency[1,2]. The diagnosis represents a challenge for the obstetrician due to the low incidence and to the poor maternal-fetal prognosis in the advanced stages of the disease.

Sarcomas are rare primary soft tissue or bone malignant neoplasms. In the period from 2009 to 2015, 404 cases were published in the journal Rare tumors, in which 0.9% corresponded to Ewing sarcoma and 0.6% to rhabdomyosarcoma[3,4].

The presence of Ewing sarcoma in pregnancy is rare. Between 1963 and 2016, only 19 cases associated with pregnancy were reported, including 3 cases of extraskeletal sarcoma. Regarding rhabdomyosarcoma, between 1970 and 2016 only 14 cases associated with pregnancy have been reported[5].

We present two cases of pregnant women with a diagnosis of Ewing sarcoma and alveolar rhabdomyosarcoma, respectively, treated at the National Institute of Perinatology of Mexico. Its approach, treatment plan and perinatal outcomes are described.

Case reports

Case 1. A 25-year old female patient, primiparous, without relevant family medical history or associated comorbidities was referred to the National Institute of Perinatology (NIPer) from a second-level hospital with a 23.0-week pregnancy and a 20-cm mass in the left gluteal region, with pain and difficulty walking. Upon admission, magnetic resonance imaging studies were requested, as well as a biopsy of the lesion in the gluteal region, which was reported in pathology as a small cell tumor compatible with extra-skeletal Ewing sarcoma. The study was complemented with a chest x-ray, where multiple pulmonary nodules were seen, the largest of 3.5 cm located in the upper left lung lobe. With a diagnosis of metastatic disease, symptomatic treatment with oxycodone was started, with a poor response.

She was hospitalized with 25 weeks of gestation and disabling left pelvic limb pain. Venous Doppler did not show evidence of thrombosis. In the control chest radiography, an increase in size was observed in the previously observed nodules, and the magnetic resonance imaging visualized tumor in the gluteal region with extensive involvement towards the sacrum and iliac bones with a suggestion of necrosis, loss of border towards the lower and left posterior uterine portion, with a separation of 2.5 cm between the fetus and the tumor. With close maternal-fetal surveillance, at 28.0 weeks hemoglobin 10.7 g/dL, platelets 518 000, aspartate aminotransferase (TGO) 111 U/dL, alanine aminotransferase (TGP) 88 U/dL, lactic dehydrogenase (DHL) 1 202 U/dL were found.

A lung maturity scheme and abdominal pregnancy resolution were indicated, obtaining a live newborn weighing 1 760 grams, height 30 cm, Apgar 7/8, Silverman 2. The patient was referred to an oncology center on the third postoperative day for palliative management, diagnosed with stage IV metastatic Ewing's sarcoma.

Case 2. A 22-year-old female patient with a diagnosis of alveolar rhabdomyosarcoma located on the right forearm, undergoing treatment with radiotherapy and chemotherapy, with recurrence on the armpit. Tumor resection was performed, continuing with a new cycle of radiotherapy, when a 12.0-week pregnancy was diagnosed. She was referred to the National Institute of Perinatology (NIPer) to continue prenatal controls. She was admitted with diagnosis of metastatic medullary syndrome and decompression of T9-11 was performed. She continued with close surveillance; however, at week 18.0 there was evidence of an absence of fetal cardiac activity, for which the medical management of the deferred abortion was initiated, obtaining a fetus of 190-grams without apparent malformations.

Discussion

Ewing sarcoma is an uncommon tumor of neuroectodermal origin, poorly differentiated and highly malignant. An incidence of 1.5 cases per million people is calculated; its presentation is more common in childhood and in young adults[6,7]. Clinically, it is aggressive, presenting with intermittent regional pain, predominantly nocturnal, which worsens over time and is accompanied in most cases by palpable fast-growing tumors[8]. It has a high rate of recurrence and metastasizes to the lungs and bone, as the most common sites, as was the case with our patient. At the time of diagnosis, 20 to 25% of patients will present with metastases, with a survival less than 30%[9,10].

The diagnostic approach begins with an adequate anamnesis, inspection and palpation. Biochemically, lactic dehydrogenase is correlated with tumor size. Imaging studies include radiographs, which do not represent fetal harm, since the exposure is less than 50 mGy9, followed by a magnetic resonance imaging, which provides high definition images on the extent of the disease. The definite diagnosis is made by biopsy, which should provide enough material to perform conventional histology and immunohistochemistry[11,12].

Adequate determination of tumor size is a critical factor in planning treatment, since tumors with a volume greater than 200 mL have been associated with a poor prognosis. Local management of Ewing sarcoma includes surgery and/or radiation therapy[13-15].

The WHO recognizes four types of rhabdomyosarcoma: embryonal, alveolar, pleomorphic and sclerosing[16]. Alveolar soft tissue sarcomas account for less than 1% of all sarcomas. The most common location is the head, neck and, in 20%, the extremities[17] as in the case of our patient. They occur between 15 and 35 years of age, predominantly in the female sex. The prognosis is typically poor; the survival rate of patients with presence of metastasis is 3 years. Despite the availability of chemotherapy and other therapeutic modalities, radical resection is considered the treatment of choice[18,19].

Hormonal and immune changes during pregnancy can affect tumor progression, which is challenging to manage, as the mother and fetus can be affected[20]. Staging and treatment should not be different from that of a non-pregnant woman. The prognosis of the neoplasia, as well as survival, will be evaluated, aiming to achieve a full-term pregnancy.

Surgery is the main treatment for musculoskeletal malignant tumors and can be performed relatively safely during pregnancy. So it should not be delayed by pregnancy. However, in the case of major pelvic or abdominal surgery, it can increase morbidity and complications[21]. In the case of chemotherapy during pregnancy, it should be avoided in the first trimester and the last dose should be administered 3 weeks before the planned date of birth, in order to avoid hematological toxicity[22,23]. Radiation therapy should be avoided during pregnancy, due to the effects on the fetus, which are dose dependent, observing between 2 and 4 weeks the possibility of abortion with doses of 50 to 100 mGy, presence of congenital anomalies and growth restriction with 200 mGy doses between 4 and 10 weeks, and presence of microcephaly and intellectual impairment when the 200 mGy doses are exceeded between weeks 10 and 17[24].

The route of delivery should be based on the obstetric recommendation. However, sometimes cesarean section is the preferred method, since the exact time of birth can be determined. The resolution of the preterm pregnancy should be evaluated, in case this could mean a positive effect for the mother or when the tumor involves the pelvic bones and the uterus, as happened in our first case.

In this group of patients, the majority of pregnancies are unintended and lead to treatment interruption. Counseling on family planning methods is essential for women of childbearing age undergoing cancer treatment, as these do not always decrease the fertility rate. Currently, available data indicate that women with cancer do not consistently use contraception. Recommendations on contraceptive methods should be based on future procreation wishes, discuss types and efficacy of contraceptive methods to be used. Include the husband in the decision, and dispel the myth that the patient will not be fertile during treatment[25,26].

In these types of cancers, there is no universal management strategy during pregnancy. The therapy of choice will be individualized, avoiding radiotherapy, due to the effects it may have on the fetus. Multidisciplinary management is essential in cancer patients, with emphasis on postponing the pregnancy until the treatment is completed and the woman is in remission.

References

1. Pentheroudakis G, Orecchia R, Hoekstra HJ, Pavlidis N. Cancer, fertility and pregnancy: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. Ann Oncol ESMO. 2010;21 Suppl 5:v266-v273. doi:10.1093/annonc/mdq198
2. Doyle LA. Sarcoma classification: an update based on the 2013 World Health Organization Classification of Tumors of Soft Tissue and Bone. Cancer. 2014;120(12):1763-74. doi:10.1002/cncr.28657
3. Pappo AS, Dirksen U. Rhabdomyosarcoma, Ewing sarcoma, and other round cell sarcomas . Clin Oncol. 2018;36(2):168-79. doi:10.1200/JCO.2017.74.7402
4. Habboush J, Hollant L, Smart B, Single M, Gaines K, Patel A, et al. Characteristics and patterns of rare malignancies. Rare Tumors. 2016;8(2):6148. doi:10.4081/rt.2016.6148
5. Zarkavelis G, Petrakis D, Fotopoulos G, Mitrou S, Pavlidis N. Bone and soft tissue sarcomas during pregnancy: A narrative review of the literature. J Adv Res. 2016;7(4):581-7. doi:10.1016/j.jare.2016.01.003
6. Galyfos G, Karantzikos GA, Kavouras N, Sianou A, Palogos K, Filis K. Extraosseous Ewing sarcoma: diagnosis, prognosis and optimal management. Indian J Surg. 2016;78(1):49-53. doi:10.1007/s12262-015-1399-0
7. Grünewald TGP, Cidre-Aranaz F, Surdez D, Tomazou EM, de Álava E, Kovar H, et al. Ewing sarcoma. Nat Rev Dis Primers. 2018;4(1):5. doi:10.1038/s41572-018-0003-x
8. Maheshwari V, Farhan AS, Adreena KA. Extraskeletal osteogenic sarcoma: a rare entity. Indian J Pathol Microbiol. 2008;51(1):56-7. doi:10.4103/0377-4929.40398

9. ACOG Committee Opinion. Number 299, September 2004 (replaces No. 158, September 1995). Guidelines for diagnostic imaging during pregnancy. Obstet Gynecol. 2004;104(3):647-51. doi:10.1097/00006250-200409000-00053

10. de Haan J, Vandecaveye V, Han SN, Van de Vijver KK, Amant F. Difficulties with diagnosis of malignancies in pregnancy. Best Pract Res Clin Obstet Gynaecol. 2016;33:19-32. doi:10.1016/j.bpobgyn.2015.10.005

11. Wang Y, Cui J, Yan X, Jin R, Hong X. Alveolar soft part sarcoma with multiple brain and lung metastases in pregnancy: A case report and literature review. Medicine (Baltimore). 2017;96(46):e8790. doi:10.1097/MD.0000000000008790

12. Paoluzzi L, Maki RG. Diagnosis, Prognosis, and treatment of alveolar soft-part sarcoma: A Review. JAMA Oncol. 2019;5(2):254-60. doi:10.1001/jamaoncol.2018.4490

13. lysyj A, bergquist JR. Pregnancy complicated by sarcoma. Report of two cases. Obstet Gynecol. 1963;21:506-9.

14. Gennatas CS, Carvounis E, Fotopoulos A, Politi HD. Extraskeletal Ewing's sarcoma in a pregnant woman: a case report. Eur J Surg Oncol. 1987;13(2):163-5.

15. Loguidice V, Tehranzadeh J, Jones E. Ewing's sarcoma and pregnancy. A case report and review of the literature. Clin Orthop Relat Res. 1986;(210):132-6.

16. Meazza C., Casanova, M., Zaffignani, E., Clerici, C. A., Favini, F., Vasquez, et al. An adolescent with rhabdomyosarcoma during pregnancy. Tumori. 2008;94(3):431-3.

17. Siepermann M, Koscielniak E, Dantonello T, Klee D, Boos J, Krefeld B, et al. Oral low-dose chemotherapy: successful treatment of an alveolar rhabdomyosarcoma during pregnancy. Pediatr Blood Cancer. 2012;58(1):104-6. doi:10.1002/pbc.22934

18. Maxwell C, Barzilay B, Shah V, Wunder JS, Bell R, Farine D. Maternal and neonatal outcomes in pregnancies complicated by bone and soft-tissue tumors. Obstet Gynecol. 2004;104(2):344-8. doi:10.1097/01.AOG.0000133502.76679.71

19. Molho RB, Kollender Y, Issakov J, Bickels J, Flusser G, Azem F, et al. The complexity of management of pregnancy-associated malignant soft tissue and bone tumors. Gynecol Obstet Invest. 2008;65(2):89-95. doi:10.1159/000108402

20. Figueiro-Filho EA, Al-Sum H, Parrish J, Wunder JS, Maxwell C. Maternal and fetal outcomes in pregnancies affected by bone and soft tissue tumors. AJP Rep. 2018;8(4):343-8. doi:10.1055/s-0038-1676289

21. Zagouri F, Dimitrakakis C, Marinopoulos S, Tsigginou A, Dimopoulos MA. Cancer in pregnancy: disentangling treatment modalities. ESMO Open. 2016;1(3):016. doi:10.1136/esmoopen-2015-000016

22. Zagouri F, Dimitrakakis C, Marinopoulos S, Tsigginou A, Dimopoulos MA. Evaluation and management of the pregnant patient with suspected primary musculoskeletal tumor for metastatic carcinoma to bone. Surg Oncol. 2016 May 4;1(3):016 doi.org/10.1016/j.suronc.2016.05.024

23. Lowe S. Diagnostic imaging in pregnancy: Making informed decisions. Obstet Med. 2019;12(3):116-22. doi:10.1177/1753495X19838658

24. Fridgen O, Sehovic I, Bowman ML, Reed D, Tamargo C, Vadaparampil S, et al. Contraception: The need for expansion of counsel in adolescent and young adult (AYA) cancer care. J Cancer Educ. 2017;32(4):924-32. doi:10.1007/s13187-016-1003-8

25. Britton L. Unintended pregnancy: A systematic review of contraception use and counseling in women with cancer. Clin J Oncol Nurs. 2017;21(2):189-96. doi:10.1188/17.CJON.189-196

26. Chabbert-Buffet N, Marret H, Agostini A, Cardinale C, Hamdaoui N, Hassoun D, et al. Clinical practice guidelines for contraception by the French National College of Gynecologists and Obstetricians (CNGOF). J Gynecol Obstet Hum Reprod. 2019;48(7):441-54. doi:10.1016/j.jogoh.2019.04.009