Cancer in Pregnancy

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KEYWORDS

- Gestational breast cancer • Cervical cancer in pregnancy
- Colon cancer in pregnancy • Hematologic cancers in pregnancy
- Lymphoma in pregnancy • Leukemia in pregnancy

KEY POINTS

- The diagnosis of cancer in the gestational period poses many difficult decisions for which multiple clinical, personal, and ethical factors need to be considered for treatment planning.
- The incidence of most gestational cancers is increasing owing to the fact that many women are deciding to delay childbearing.
- In general, most chemotherapy treatments should be delayed until the second and third trimesters to avoid fetal toxicity.
- Pregnancy should not be a reason to delay a diagnostic workup for symptoms concerning for cancer.

INTRODUCTION

Because more women are waiting to have children until later in life, cancer diagnoses in pregnancy are becoming more common. Gestational cancer is defined as a new cancer diagnosis during pregnancy or in the first year postpartum.[1] The most common cancers in reproductive aged women are breast, melanoma, thyroid, cervical, and lymphomas, listed in order of decreasing frequency.[2] The diagnosis of cancer in the gestational period poses many difficult decisions for which multiple clinical, personal, and ethical factors need to be considered for treatment planning. We review the pertinent information for some of the more common gestational cancers, as well as some less common, but with increasing prevalence in the United States.

BREAST CANCER

Gestational breast cancer is considered any breast cancer occurring either during pregnancy, in the year after delivery, or anytime during lactation. Breast cancer is

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one of the most common pregnancy-associated cancers. Pregnancy-associated breast cancer occurs in 20% of breast cancer patients younger than 30 years of age.[3] The incidence is only 0.4% of all breast cancers diagnosed in women aged 16 to 49, however the rate is increasing.[1] This increase is most likely secondary to delaying the age at which women begin childbearing.

The majority of gestational breast cancer is infiltrating ductal carcinoma. Gestational breast cancer is more likely to be poorly differentiated and have metastases at the time of diagnosis when compared with nonpregnant women.[4] There is typically a lower incidence of estrogen receptor–positive, progesterone receptor–positive breast cancer diagnosed during pregnancy and the postpartum period, whereas human epidermal growth factor 2–positive tumors seem to be equal in incidence to that of nonpregnant women.[5]

A diagnosis of breast cancer during pregnancy or lactation is often more challenging given the normal physiologic changes in the breast during these periods.[6] For example, rapid enlargement and hypertrophy during pregnancy and the postpartum period can distort the anatomy of the breast. Often the diagnosis is delayed by pregnancy and lactation; hence, the diagnosis is made at more advanced stages during pregnancy.[7] Interestingly, a breast cancer diagnosis during lactation can be detected by the milk rejection sign, in which the nursing infant will refuse to nurse from the cancerous side.[2] Any breast mass persisting for more than 2 weeks during pregnancy or lactation needs to be evaluated. Even though 80% of breast biopsies during pregnancy are benign, delayed diagnosis because of pregnancy or lactation is critical to prognosis.[8]

If a breast mass is identified in pregnancy, it should be evaluated with imaging, typically a diagnostic mammogram. This imaging modality is considered safe during pregnancy and poses little known threat to the developing fetus.[9] An abdominal shield can be used, although the data supporting the added safety of this technique are minimal.[10–12] The standard dose of radiation of a mammogram (200–400 mrads) is negligible to the developing fetus.[9] A biopsy should be performed of any suspicious mass in pregnancy or lactation, regardless of mammogram results. Evaluation for advanced stage disease with imaging of the chest, liver, bone, and brain should also be performed. To image the chest during pregnancy a chest radiograph may be performed. The gravid uterus can make it difficult to rule out metastasis at the diaphragm or inferior lung lobes, in which case an MRI of the chest may be performed without contrast.[13] MRI without contrast has documented safety in pregnancy and can also be used to evaluate the abdomen, pelvis, and brain. There is limited information on the safety of PET scans during pregnancy and these generally should be avoided.[14] If there is suspicion for bone metastasis, a radionuclide (technetium-99M) bone scan can be obtained and also has a negligible radiation dose to the fetus.[9]

The treatment for pregnancy-associated breast cancer is challenging and should be managed by a maternal–fetal medicine specialist, breast surgeon, and oncologist. The data on treatment of gestational breast cancer are limited to retrospective reviews and case series.[15–18] In the past, it was thought that termination of pregnancy would improve prognosis and survival; however, this supposition has not been supported by evidence.[19] Elective termination of pregnancy can be considered in the instance of very advanced stage disease as a personal choice for the mother. In contrast, there is some evidence to suggest termination of pregnancy actually worsens the prognosis of breast cancer. However, these studies are retrospective and the data are likely skewed by the fact that more women with advanced disease choose termination of pregnancy.[19,20]

A key to breast cancer surgical staging is axillary lymph node dissection. This procedure can be undertaken in the pregnant patient with little if any additional risk to the fetus.[21,22] Less is known about the technique of sentinel lymph node dissection, using radiation, and its safety during pregnancy. Some authors conclude that the minimal dose of radiation used in this procedure is well below the 50-mGy threshold for fetal effects.[22] However, it is not known if the lymphatic drainage channels are altered by pregnancy and, therefore, the efficacy of this procedure is unknown in the pregnant patient.[17] There is 1 case series that documents the safety of sentinel lymph node biopsy and mapping in 12 pregnant patients.[21]

In general, the surgical treatment of breast cancer during pregnancy should be undertaken much like that in the nonpregnant population. Depending on the stage of cancer, the patient may undergo a local excision or lumpectomy versus a mastectomy.[23] For early stage treatment, a nonpregnant patient may opt for breast-conserving treatment along with radiation therapy. In a pregnant patient, a mastectomy is recommended for those patients who would like to continue their pregnancies because radiation therapy would be necessary with conservative treatment and is to be avoided during pregnancy.[24] Mastectomy can be performed with very little risk to the fetus in any trimester. Breast reconstruction surgery should be postponed until the completion of pregnancy because there is no urgency to this procedure, and it is typically postponed until completion of adjuvant treatments.

Radiation therapy, in contrast, has potential risk to the fetus.[9] Depending on gestational age, these risks include pregnancy loss and fetal anomalies if exposed in the first trimester and growth restriction and potential carcinogenic risks in childhood if exposed in the second or third trimesters.[25] The typical therapeutic radiation dose given for breast cancer is 46 to 60 Gy.[25] This translates into a fetal dose of 0.04 to 0.15 Gy. For fetuses less than 16 weeks of gestation, this is above the threshold of 0.10 to 0.2 Gy, where effects may be seen. After 16 weeks of gestation, a much higher dose is likely tolerated by the fetus, 0.50 to 0.70 Gy.[26] In most cases, radiation therapy can be avoided or delayed until after pregnancy. However, in some situations it may be beneficial to proceed with radiation therapy during pregnancy and the risks and benefits should be discussed in each unique clinical scenario.

There are supportive data to show that chemotherapy in the pregnant patient is well-tolerated by the fetus.[27,28] The most common and well-studied regimens in pregnancy are doxorubicin plus cyclophosphamide or fluorouracil, doxorubicin, and cyclophosphamide. These treatments vary slightly from the typical chemotherapy regimens in the nonpregnant patient (**Box 1**).[27] All of these agents were previously considered pregnancy risk factor category D. The most critical time period in gestation to avoid systemic chemotherapy is organogenesis, from week 5 to week 10 of gestation after the last menstrual period. This time period poses the greatest risk for fetal congenital anomalies and pregnancy loss. This risk has been estimated to be as high as 15% to 20%.[28–30] The most significant risk of chemotherapy in the second or third trimesters is not for congenital anomalies, but intrauterine growth restriction and preterm delivery.[27,28] Multiple case reports have supported the safety of anthracyclines when used in the second and third trimesters of pregnancy.[31,32] Doxirubicin is preferred to idarubicin and epirubicin during pregnancy because of reports of intrauterine demise with idarubicin and epirubicin.[31,33–36]

The use of taxanes as a chemotherapy agent is generally considered safe in the second and third trimesters of pregnancy as well.[15] The use of trastuzumab for human epidermal growth factor 2–positive breast cancers during pregnancy is considered contraindicated secondary to reported oligohydramnios and pulmonary hypoplasia.[37]

Box 1
Common chemotherapy regimens for breast cancer

Nonpregnant patients with HER2-negative breast cancer

Docetaxel and cyclophosphamide

Doxorubicin and cyclophosphamide followed by paclitaxel

Doxorubicin and cyclophosphamide

Doxorubicin and cyclophosphamide followed by paclitaxel

Docetaxel, doxorubicin, and cyclophosphamide

Cyclophosphamide, methotrexate, and fluorouracil

Fluorouracil, epirubicin, and cyclophosphamide

Fluorouracil, epirubicin, and cyclophosphamide with paclitaxel

Fluorouracil, epirubicin, and cyclophosphamide with docetaxel

Nonpregnant patients with HER2-positive breast cancer

Pertuzumab, trastuzumab, and docetaxel followed by fluorouracil, epirubicin, and cyclophosphamide

Trastuzumab, pertuzumab, carboplatin, and docetaxel

Fluorouracil, epirubicin, and cyclophosphamide followed by docetaxel, pertuzumab, and trastuzumab

Docorubicin and cyclophosphamide followed by paclitaxel and trastuzumab

Pertuzumab, trastuzumab, and docetaxel

Pregnant patients (HER2-positive/negative)

Doxorubicin and cyclophosphamide

Fluorouracil, doxorubicin, and cyclophosphamide

Abbreviation: HER2, human epidermal growth factor 2.
Data from Giacalone PL, Laffargue F, Benos P. Chemotherapy for breast carcinoma during pregnancy: a French national survey. Cancer 1999;86(11):2266–72.

Although requested by many pregnant patients, a delay in treatment with systemic chemotherapy should be avoided. The risk of metastasis increases with every few months of delayed treatment by 5% to 10%.[7]

Tamoxifen, a selective estrogen receptor modulator, is often used as treatment and for the prevention of recurrence of breast cancer for estrogen receptor–positive cancers. Its use during pregnancy is generally avoided. The long-term effects on the neonate are not known and it has been associated with miscarriage and congenital malformations, specifically genitourinary malformations.[38,39] There have also been case reports of patients who have taken tamoxifen during pregnancy and their infants were born without anomalies.[38,40] More information is needed on the safety of this medication during pregnancy.

Tamoxifen likely inhibits the ability to breastfeed by suppressing prolactin.[41] Therefore, the potential benefits of tamoxifen in protecting the patient from recurrence must be weighed with the benefits of breastfeeding and a decision to discontinue nursing should tamoxifen therapy be desired.

The common anthracyclines and cyclophosphamide agents used for breast cancer are excreted into breast milk and should be avoided while nursing.[31,33–36] For trastuzumab, it is recommended by the manufacturer to wait at least 6 months after the last

dose to begin breastfeeding owing to the 7-month wash out period for the drug concentrations to be eliminated from the body.[42]

Delivery timing should take into account nadirs in cell counts from chemotherapy. Delivery should be avoided within 3 to 4 weeks of the last chemotherapy treatment to avoid increased risks of maternal sepsis and bleeding, as well as any transient myelosuppressive effect of the chemotherapy on the fetus.[43] The optimal timing of delivery has been studied and a decision analysis model taking into account stage and hormone status concluded that for stage I and II cancers, delivery at 36 weeks results in the greatest number of overall quality-adjusted life years.[44] Route of delivery is generally not affected by breast cancer diagnosis and should be determined by normal obstetric indications.

Although studies evaluating the prognosis of pregnancy-associated breast cancer have had mixed results, in general it is thought that the survival of pregnancy-associated breast cancer is similar to that of the nonpregnant patient.[45] The diagnosis of breast cancer in the postpartum period has been postulated to be a particularly high-risk scenario, with some studies estimating increased mortality if diagnosed 4 to 6 months after delivery.[46] More epidemiologic studies need to be done to determine if this risk is actually increased because of diagnosis in the postpartum period or if it is because disease was present during pregnancy and there was a delay in diagnosis.

CERVICAL CANCER

Cervical cancer is one of the most common gynecologic cancers associated with pregnancy, but in actuality occurs rarely, 1 per 1200 to 10,000 pregnancies.[47] Depending on the stage of cervical cancer, its implications during pregnancy and future fertility range from very little impact to greatly impacting a woman's life and childbearing ability.[48] In general, the prognosis for cervical cancer is unchanged by pregnancy. However, depending on tumor size and location, cervical cancer may dictate the route of delivery.[49] As with other gestational cancers, there are no large randomized prospective studies guiding treatment. Therefore, we must rely on studies from nonpregnant patients and case series.

Women with abnormal cervical cytology who are pregnant should undergo evaluation as indicated. Colposcopy with biopsies should be performed if there is suspicion for cervical intraepithelial neoplasia II/III.[50] Colposcopy can be challenging in pregnancy given the normal physiologic changes of the cervix, including increased vascularity and ectropion that occur during pregnancy.[51] Staging of cervical cancer is typically done clinically (**Table 1**).[52] The imaging studies suggested for cervical cancer staging in pregnancy are chest radiograph with abdominal shield or computed tomography scan of the chest for suspected lung metastases.[53,54] For suspected higher stage cancers, the urinary tract, abdomen, and pelvis can be imaged with MRI to evaluate tumor size, as well as vaginal, stromal, parametrial, and lymph node involvement.[54] Cystoscopy and proctoscopy for cervical cancer staging can be performed if needed for accurate staging. Cervical cancer has not been known to metastasize to the placenta or fetus.

The management of invasive cervical cancer in pregnancy is challenging and each individual patient requires thoughtful, multidisciplinary planning. In general, definitive treatment for invasive cervical cancer in the pregnant patient should be undertaken if the patient desires termination of pregnancy in the first and early second trimesters, has positive lymph nodes, or shows progression of disease during pregnancy.[55] For desired pregnancies less than 22 weeks of gestation at the time of diagnosis, patients

Table 1
International Federation of Gynecology and Obstetrics cervical cancer staging system

Stage	Criteria
I	Carcinoma is strictly confined to the cervix.
IA	Microscopic invasion. Invasion is limited to measured stromal invasion with a maximum depth of 5 mm and no wider than 7 mm.
IA1	Measured invasion of stroma <3 mm in depth and <7 mm width.
IA2	Measured invasion of stroma >3 mm and <5 mm in depth and 7 mm width.
IB	Clinical lesions confined to the cervix of preclinical lesions greater than stage IA.
IB1	Clinical lesions no greater than 4 cm in size.
IB2	Clinical lesions >4 cm in size.
II	Carcinoma invades beyond the uterus but not to the pelvic wall or lower one-third of the vagina.
IIA	Tumor without parametrial invasion or involvement of the lower one-third of the vagina.
IIA1	Clinically visible lesion 4 cm or less in greatest dimension with involvement of less than the upper two-thirds of the vagina.
IIA2	Clinically visible lesion >4 cm in greatest dimension with involvement of less than the upper two-thirds of the vagina.
IIB	Tumor with parametrial invasion.
III	Tumor extends to pelvic wall and/or involves the lower one-third of vagina and/or causes hydronephrosis or a nonfunctioning kidney.
IIIA	Tumor involves the lower one-third of vagina, no extension to the pelvic sidewall.
IIIB	Tumor extends to the pelvic sidewall and/or causes hydronephrosis or a nonfunctioning kidney.
IVA	Tumor invades the mucosa of the bladder or rectum, and/or extends beyond the true pelvis.

Adapted from Pecorelli S. Revised FIGO staging for carcinoma of the vulva, cervix, and endometrium. Int J Gynaecol Obstet 2009;105(2):103–4; with permission.

should undergo lymphadenectomy to determine node status. This procedure can be performed laparoscopically, with little harm to the fetus based on limited data.[56]

For microinvasive disease, a cold knife cone can be performed during pregnancy.[57] There are substantial risks of bleeding as well as miscarriage with cone procedures during pregnancy and these risks increase as gestational age increases.[58]

For stage IA2 to IB1 cancers, a large conization can be performed if pregnancy continuation is desired with a reported risk of parametrial extension of less than 1%.[59,60] There is an option to place a cervical cerclage at the time of conservative surgery, although there is no evidence to support this technique; it might be extrapolated from data on trachelectomies.[61] For higher stage cervical cancers and desired pregnancy, the options include neoadjuvant chemotherapy with or without early delivery.[62] The standard chemotherapy of cisplatin and paclitaxel is generally well-tolerated by the fetus if given in the second and third trimesters, although no long-term data exist.[63] Delivery timing is optimal if the last dose of chemotherapy is given at 34 to 35 weeks of gestation with delivery at term.[53,62]

For pregnancies greater than 22 weeks of gestation at the time of diagnosis, lymphadenectomy becomes too technically challenging to be beneficial. For lower stage disease, IA to IB1, treatment can be deferred until after delivery with very little known risk of metastases.[64,65] For higher stage cancers in pregnancies greater than 22 weeks

of gestation, treatment is individualized, but should include a discussion of risks of delay in treatment and the possibility of early delivery.[66,67] Often it is decided by the patient and her family to undergo chemotherapy with definitive treatment status after delivery.

The route of delivery in patients with cervical cancer also needs to be considered. With a general lack of data on this topic, it is prudent to allow for vaginal delivery in early stage cervical cancers; however, episiotomy should be avoided, because there have been case series documenting recurrence at the site of episiotomy.[67–69] The limited data support unchanged maternal outcomes for patients with lower stage disease (IA1 and 1A2) who have had vaginal deliveries.[47] For higher stages, limited case report evidence suggests cesarean delivery results in improved maternal outcomes.[70] For higher stage or bulky tumor, cesarean delivery should be performed to avoid hemorrhagic risk.

The prognosis of cervical cancer in the pregnant patient is likely not different from that of the nonpregnant patient.[62,71] The risks for the fetus include preterm delivery and growth restriction if the patient is given systemic chemotherapy.[65] A diagnosis of cervical cancer in the pregnant patient is an ethically challenging situation and each patient's care plan should be handled individually.

HEMATOLOGIC CANCERS

Of the hematologic cancers, the most common is Hodgkin lymphoma. It is the fourth most common malignancy to be diagnosed during pregnancy, likely because of the younger age of onset of this cancer.[72] The incidence of Hodgkin lymphoma in pregnancy is 1 in 1000 to 1 in 6000 pregnancies.[73] The leukemias are more rare, effecting 1 in 75,000 pregnancies.[74,75] Although more rare, there are some important perinatal risks to consider with the diagnosis of leukemia during pregnancy. Because leukemias are so rare, there is little to guide management during pregnancy.[76]

The most common type of leukemia is acute myeloid leukemia, with a typical age of onset in the reproductive years.[76] The presenting symptoms are associated with pancytopenia; the most common symptom is fatigue. The diagnosis is typically made with abnormal screening complete blood count that occurs at the first prenatal visit. Confirmation of the diagnosis is made with a bone marrow biopsy.

If diagnosed in the first trimester, consideration for termination should be given because a delay in systemic chemotherapy likely adds significant risk to the mother.[76] With the standard systemic therapy of anthracycline and cytarabine given in the second or third trimesters, the complete response rate is 87% and is similar to that of nonpregnant females.[75] Because of the underlying risk of thrombocytopenia and disseminated intravascular coagulopathy in these patients, special caution and consideration to timing of delivery should be undertaken.[77]

More is known about Hodgkin lymphoma during pregnancy. It occurs in 1 in 1000 to 1 in 6000 pregnancies and makes up 3% of all Hodgkin diagnoses.[73] Hodgkin lymphoma usually presents with symptoms of painless lymphadenopathy, fatigue, shortness of breath, anemia, or thrombocytopenia, some of which can be difficult to discern from other common pregnancy symptoms.[73] The diagnosis of Hodgkin lymphoma in pregnancy should be handled no differently than in the nonpregnant patient. This process usually consists of a lymph node biopsy. It is typically performed under local anesthesia, but can also be done under general anesthesia with little known risk to the fetus, although the effects of prolonged exposure to general anesthetic agents on the developing fetus are not known.[78] Staging evaluation typically requires chest

radiograph with abdominal shielding, laboratory evaluation including a sedimentation rate (which can be elevated in pregnancy), and an MRI of the abdomen.[72]

The standard systemic chemotherapy regimen for Hodgkin lymphoma is doxorubicin, bleomycin, vinblastine, and dacarbazine. Depending on gestational age at diagnosis and the stage of the disease, this same regimen is recommended in the pregnant patient.[29] Another option often undertaken during pregnancy is maintenance therapy with vincristine alone.

There is evidence to support the safety of the doxorubicin, bleomycin, vinblastine, and dacarbazine chemotherapy regimen in pregnancy.[79] An observational study showed that there was likely more risk from iatrogenic preterm delivery to the offspring of these patients than from the exposure to chemotherapy.[79]

If the patient is diagnosed in the early first trimester, treatment should be delayed until the second or third trimesters when the teratogenic effects of chemotherapy are minimal.[80] In the second and third trimesters, systemic chemotherapy does instill a risk of intrauterine growth restriction, preterm delivery, and perhaps a long-term risk of the childhood cancer, although this finding has not been well-documented.[81] If the diagnosis is made in the third trimester of pregnancy, it is feasible for the woman to defer treatment until after delivery unless disease burden is high or progression is thought to be imminent.[80] The optimal patients for whom deferral of treatment is considered are those with early stage disease (IA to IIA) or stable disease presenting later in gestation. Although there have been no prospective trials considering deferral of treatment, there have been 2 case series supporting this approach.[82–84] Chemotherapy should be timed to avoid nadir of cell counts close to term and the goal for delivery timing should be at least 34 weeks or after, when the risks from prematurity are lower.

Pregnancy seems to have little effect on the course of disease in women with Hodgkin lymphoma.[73] One case series followed 48 pregnant women with Hodgkin lymphoma and compared outcomes with matched nonpregnant women; the 20-year survival rate was no different.[73] There have been other case series with similar results.[73,83–85] The overall survival rate for the pregnant patient with Hodgkin lymphoma is estimated to be 71% and is similar to that of the nonpregnant patient.[86]

COLON CANCER

Colon cancer is one of the less common malignancies to encounter during pregnancy; however, the age at which colon cancer is diagnosed in women is decreasing, with a median age at diagnosis of 32 years in pregnant women.[87] It is also important to consider, because many of the symptoms of colon cancer are similar to those related to pregnancy: nausea, vomiting, change in bowel habits, or rectal bleeding. The symptom of rectal bleeding is often overlooked in the pregnant patient and misdiagnosed as bleeding from hemorrhoids.[87] Any of these symptoms should prompt investigation without delay.

There is little evidence that establishes a different normal carcinoembryonic antigen level in pregnancy; therefore, any increase should be evaluated. These tests are typically drawn in the patient presenting with the symptoms listed above. Once colorectal cancer is suspected, the next step in a nonpregnant patient is a colonoscopy, barium enema, or a computed tomography scan. A colonoscopy, if needed, can be done safely during pregnancy.[87] MRI rather than a computed tomography scan is ideal for staging purposes as well as evaluation of tumor burden.[87] A systematic review of the current literature and cases of colon cancer in pregnancy concludes that survival is similar to that of nonpregnant patients; however, stage at diagnosis tends

to be more advanced for pregnant women.[87] Interestingly, metastasis to the ovary is more common in pregnancy-associated colon cancer, occurring in 23% versus 8% of pregnant and nonpregnant women, respectively.[88,89] Placental metastasis is extremely rare.

If diagnosed early in pregnancy, the patient has to consider excision of tumor while pregnant versus termination of pregnancy followed by surgical excision. If diagnosed later in pregnancy, the patient will undergo surgical resection versus delivery if at a gestational age with acceptable prematurity outcomes. Chemotherapy is to be avoided during the first trimester, but can be given in the second or third trimester with little risk to the fetus.[53] The typical adjuvant chemotherapy regimen for colon cancer is Folfox (5-flurouracil, leucovorin, and oxaliplatin).[90] It is generally tolerated by the fetus later in gestation, although little is known in terms of the long-term effects.[91–96] There is especially little evidence to guide the use of oxaliplatin. There are 7 documented pregnancies exposed to this drug, 5 of which underwent treatment after the first trimester.[91–96] Only hypothyroidism was reported in one of the infants, but no birth defects were noted.[96] Two of the infants were born preterm and were noted to be small for gestational age.[96] There is more known about 5-flurouracil and leucovorin, which have some long-term follow-up information and are generally considered low risk if given in the second and third trimesters.[97]

In general, pregnancy outcomes are favorable for pregnant patients with colon cancer.[98] Patients should be counseled on the increased risk for cesarean delivery if there is large abdominal or pelvic tumors, preterm birth and small for gestational age/intrauterine growth restriction for those being treated with systemic chemotherapy.[98] Delivery timing depends on gestational age at diagnosis and the treatment plan, and should be determined with the aid of multidisciplinary teams. Delivery can generally be achieved vaginally; however, some expert opinion recommendations include cesarean section if there is an anterior rectal tumor present given the increased risks of bleeding from the tumor site during delivery.[97]

In general, the prognosis for the pregnant patient diagnosed with colon cancer is considered to be poor, but stage for stage the prognosis is similar to that of nonpregnant patients.[97] Typically, more advanced stages are being diagnosed in the pregnant patient given the risk for delay in diagnosis in this population.

SUMMARY

Cancer in pregnancy marks an emotional and devastating diagnosis that requires a multidisciplinary approach to management. Each case needs to be considered individually; there are no consensus guidelines and few prospective studies to guide treatment.

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