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Breast cancer in pregnancy: A brief clinical review

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As global wealth increases and demographic changes similar to Europe and North America start affecting other societies, the global breast cancer epidemic will coincide with a delayed maternal age during first and subsequent pregnancies. Breast cancer in pregnancy will continue to increase, and standardized treatment strategies are required to be developed. This study will review current diagnostic and treatment approaches.

Epidemiology of breast cancer

The incidence of cancer, including breast cancer, during pregnancy is increasing, but remains low overall. In a country like Germany, with about 700,000 childbirths per year, the estimated incidence of 2.3–7 cancers per 100,000 childbirths leads to a total of approximately 16–49 cancer cases per year [1,2].

Given this low number and the increasing stratification of breast cancer treatment based on hormonal status, human epidermal growth factor receptor (HER2) status as well as stage and, possibly, genetic risk factors, prospective trials are unlikely to be conducted anywhere, particularly when the ethical restraints surrounding pharmacologic trials in pregnancy are provided. Because of this, current treatment recommendations rely on retrospective evidence, animal models, expert opinions, and sound clinical judgment. This study will briefly review the current state of the art.

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Clinical presentation

Because mammography is not performed routinely in pregnant patients, clinical presentation during pregnancy is usually a suspicious palpable nonpainful lump in the breast. Because of the physiologic breast engorgement during pregnancy, diagnosis tends to be delayed in pregnant patients, leading to a slightly worse prognosis than in nonpregnant patients [3].

As every suspicious lesion of the breast needs to be evaluated, eventually by biopsy, >80% of such lesions will be benign [4].

Diagnostic procedures

Clinical breast examination is followed by breast ultrasound. Limitation of radiation exposure to the embryo or fetus is the primary focus of diagnosis. On the basis of the results of breast ultrasound, a core biopsy can be performed under local anesthesia without affecting the fetus. This can be the first diagnostic procedure when malignancy is less suspected by the clinical and ultrasound examinations.

When malignancy is highly suspected, mammography should be performed before tissue-altering biopsy to eliminate additional tumors, contralateral cancer, and multicentricity. Radiation exposure to the fetus is almost negligible in mammography [5].

Magnetic resonance imaging (MRI) of the breast should be avoided, as gadolinium affects the gestation. Nongadolinium MRI can be used as a substitute for skeletal scintigraphy if such staging procedures are deemed absolutely necessary [6].

The final diagnosis is made by pathologic examination of a biopsy specimen. Histopathology of breast cancer is similar in both pregnant and nonpregnant patient groups with a high incidence of invasive ductal carcinoma, high rate of poorly differentiated (G3) tumors, and estrogen-receptor negativity [5]. HER2 positivity is higher than that of the overall breast cancer population, but again similar to a comparable age group [7].

Staging procedures

Breast cancer in pregnancy is rare and primary metastasis is even rarer, but always possible. Routine staging procedures for breast cancer in nonpregnant patients often include abdominal and thoracic computed tomography (CT) scans and nuclear medicine imaging with skeletal scintigraphy, both of which present problems of radiation exposure [8]. Depending on gestational age, which is one of the key determining factors for treatment sequence and strategy, clinical judgment must be made to determine whether staging can be performed after childbirth.

If staging is considered essential, it should consist of a chest X-ray with uterine shielding, a liver ultrasound, and skeletal MRI without contrast [9].

When MRI is unavailable and clinical signs make the evaluation of bone metastasis imperative, skeletal scintigraphy can be performed with sufficient intravenous hydration and a bladder catheter to ensure rapid cleaning and minimal radiation in the pelvic region [10].

Assessment of the axillary status has ceased to be part of the treatment and has become part of the staging procedures. Because pregnant patients have an increased incidence of nodal metastasis and because the exact nodal status can potentially determine the ideal therapeutic approach, exact evaluation of the axillary lymph nodes has become an integral part of staging [11]. Again, ultrasound of the axilla has become the first step, followed (if necessary) by aspiration cytology (which is no longer considered acceptable for diagnosis of the tumor, but can be used to asses nodal status). Definitive evaluation of the nodal status is possible by sentinel lymphonodectomy, which can be performed during pregnancy; technetium injection is acceptable, whereas blue-dye injection should be avoided [12,13]. Although American Society of Clinical Oncology (ASCO) guidelines still caution the use of technetium sentinel during pregnancy, the existing literature and theoretical considerations do not argue against its use [14].