CASE RECORDS of the MASSACHUSETTS GENERAL HOSPITAL

Case 26-2024: A 59-Year-Old Woman with Aphasia, Anemia, and a Breast Mass

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PRESENTATION OF CASE

Dr. Sahar Shahamatdar (Medicine): A 59-year-old woman was referred to the multidisciplinary breast oncology clinic of this hospital for evaluation of a long-standing breast lesion.

The patient had had limited medical care since she was 34 years of age. Three weeks before the current evaluation, she presented to another hospital with fever, confusion, and word-finding difficulties. At the time of that presentation, the patient was inattentive and disoriented, and mild expressive aphasia without motor deficits was present. She had a large, bleeding exophytic mass in the right breast.

Dr. Janice N. Thai: Computed tomography (CT) of the head, performed before and after the administration of intravenous contrast material, reportedly revealed a wedge-shaped area of low density in the left temporoparietal region. This finding is consistent with acute infarction.

Dr. Shahamatdar: A screening test for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was positive. Laboratory studies, including a complete blood count, were notable for a hemoglobin level of 4.3 g per deciliter (reference range, 11.0 to 15.0), a mean corpuscular volume of 69.7 fl (reference range, 80.0 to 100.0), and a platelet count of 922,000 per microliter (reference range, 130,000 to 400,000).

Dr. Thai: CT of the chest, abdomen, and pelvis, performed after the administration of intravenous contrast material, revealed a large cystic and solid mass in the right breast, measuring 14.9 cm by 16.2 cm by 20.0 cm (Fig. 1A and 1B). Associated prominence of the intramammary, internal mammary, subpectoral, and axillary lymph nodes was observed. Heterogeneous lesions of the ribs and pulmonary nodules that could indicate metastatic disease were also noted (Fig. 1C). Magnetic resonance imaging (MRI) of the head, performed after the administration of intravenous gadolinium, provided additional evidence of ischemic stroke and showed no evidence of intracranial metastases (Fig. 1D and 1E).

Dr. Shahamatdar: The patient was admitted to the hospital. Packed red cells were transfused, and a compressive bandage was applied to the breast lesion. By hospital

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CME

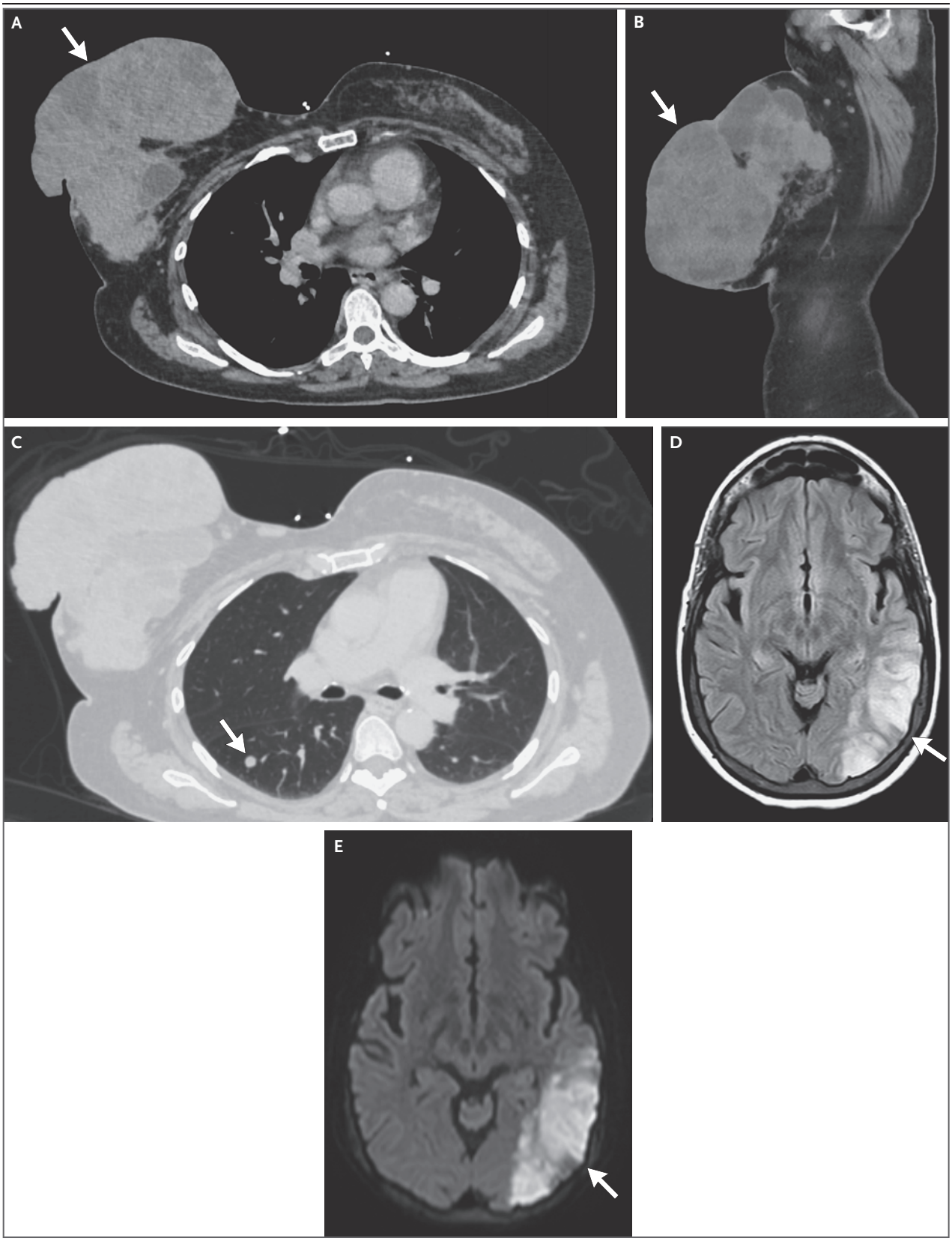

Figure 1 (facing page). Imaging Studies.

CT of the chest was performed. Axial and sagittal images (Panels A and B, respectively) show a large, multilobulated, cystic and solid mass (measuring 14.9 cm by 16.2 cm by 20.0 cm) involving the entire right breast and overlying skin (arrows). An axial image (Panel C) shows a 0.8-cm solid pulmonary nodule in the right lower lobe (arrow). MRI of the head was also performed. Axial images from a fluid-attenuated inversion recovery sequence and diffusion-weighted imaging (Panels D and E, respectively) show acute infarction in the left posterior temporal, parietal, and occipital lobes (arrows).

day 2, the patient's confusion and inattention had resolved, but mild expressive aphasia persisted. Consent was obtained from the patient, and she underwent incisional biopsy of the breast lesion while under local anesthesia. The patient's hospitalization was complicated by cellulitis in the right arm at the site where a peripheral intravenous catheter had been placed, for which she was treated with intravenous antibiotic agents. She was discharged on hospital day 11 with pathological results pending, and follow-up was planned with the breast oncology clinic of this hospital.

Four days after discharge, the patient had a sudden onset of profuse bleeding from the breast lesion, which led to hypotension, and she was again admitted to the other hospital. She received a total of 5 units of packed red cells, and bleeding was managed conservatively with sterile gauze and compressive bandaging. No further episodes of bleeding occurred. On hospital day 4, she was discharged home with plans to attend a multidisciplinary oncology evaluation at this hospital 2 days later.

In the breast oncology clinic, the patient reported worsening discomfort, bleeding, and drainage from the breast mass and the associated wound. She noted that progressive fatigue had developed in recent weeks but reported no fever or chills. She had first noted a palpable lesion in the right breast when she was 32 years of age, approximately 27 years before the current presentation. The patient had pursued an evaluation with breast imaging at that time, and she recollected that the lesion had been characterized as a benign finding. A biopsy had not been performed. During the intervening years, she had not pursued routine medical care, including breast imaging. She attributed the lack of medical follow-up to ongoing demands related to caring for her young child and stressors in her personal and work life. She reported that slow but steady growth of the breast lesion had occurred during those years. Approximately 2 years before the current presentation, the patient had noted more rapid growth of the lesion with progressive skin breakdown, discomfort, and drainage that she thought was related to chronic infection.

Menarche had occurred when the patient was 10 years of age and menopause at 50 years of age. The patient had had one pregnancy, and she had used hormonal contraception for a total of 15 years during her lifetime. She had not received any hormone-replacement therapy. At the time of the current presentation, the Eastern Cooperative Oncology Group performance-status score was 1 (assessed on a scale of 0 to 5, with higher scores indicating greater disability). Medications included amlodipine, atorvastatin, ferrous sulfate, and polyethylene glycol. Her family history included breast cancer in her maternal aunt. She lived in New England with her adult son and was a small-business owner. She drank alcohol occasionally and did not smoke cigarettes.

On physical examination, the oral temperature was 36.5°C, the blood pressure 136/81 mm Hg, the pulse 116 beats per minute, and the oxygen saturation 99% while the patient was breathing ambient air. A large, fungating breast mass was present, which had foci of necrosis and areas of dried blood without palpable ipsilateral lymphadenopathy. Auscultation of the heart was notable for tachycardia without murmur. A neurologic examination did not reveal motor deficits, and the previously reported expressive aphasia had resolved. The patient was attentive and oriented to person, place, time, and situation. The affect and mood were appropriate, and she did not report hallucinations, suicidal ideation, or symptoms of depression. She had normal insight and capacity with regard to the nature of her diagnosis and recent clinical course.

Management decisions were made.

DIFFERENTIAL DIAGNOSIS

Dr. Seth A. Wander: I was involved in the care of this patient, and I am aware of the final diagnosis

in this case. This 59-year-old woman presented with a large, fungating breast mass, which she had first noticed approximately 27 years earlier. The differential diagnosis for a long-standing, slow-growing breast mass includes both malignant and benign processes.

BREAST MASS

Invasive breast cancers represent a broad spectrum of disease.[1] Approximately 70% of breast cancers are hormone receptor (HR)–positive cancers, which are driven by estrogen-dependent signaling pathways, and approximately 20% are human epidermal growth factor receptor 2 (HER2)–positive cancers, which are dependent on HER2 pathway activation. Triple-negative breast cancers, which are negative for the estrogen and progesterone receptors and for HER2 overexpression, account for approximately 10% of invasive breast tumors.

In terms of histologic subtype, approximately 70 to 80% of invasive breast cancers are infiltrating ductal carcinomas that manifest as solid mass lesions.[2] Lobular carcinomas are less common and may manifest with more diffuse and less cohesive disease, which can be difficult to detect with the use of breast imaging and clinical examination. Multiple additional, uncommon histologic subtypes have also been defined.[2] Other rare invasive diseases that can manifest as breast masses include phyllodes tumors (a type of fibroepithelial lesion), lymphomas, sarcomas, adenoid cystic carcinomas (which can arise in the breast but more frequently occur in the head and neck region), and metastatic lesions to the breast from other primary sites. Each of these scenarios probably accounts for less than 1% of invasive breast diagnoses.

Benign breast lesions can also manifest as long-standing, slow-growing masses.[3] Fibroadenomas are common and typically develop in younger women. Patients with fibroadenomas may have multiple concurrent lesions, which can enlarge or shrink over time and are typically associated with menstrual cycles. Other benign lesions that can enlarge over time include simple cysts, abscesses, and fat necrosis (usually a benign response to breast trauma or previous surgery).

PROLONGED DISEASE COURSE AND GROWTH PATTERN

In this patient, the extremely prolonged time course and pattern of growth, with skin breakdown and bleeding, make several diagnoses unlikely. For example, this presentation would be highly atypical for HER2-positive and triple-negative breast cancer, given that the prolonged growth interval and degree of local tumor erosion would be unusual without concurrent metastatic disease, increased systemic symptoms, and the threat of death earlier in the disease process. Some HR-positive tumors, particularly lower-grade lesions, can be slow-growing and cause local erosion, bleeding, and pain over prolonged periods without metastatic spread. This patient's presentation would also be atypical for benign lesions, including fibroadenomas (given the clinical appearance and the absence of a relationship to previous menstrual cycles), cysts (given the clinical appearance), abscesses (given the absence of systemic signs of infection and the time course), and fat necrosis (given the progressive nature, the absence of previous trauma or surgery, and the appearance).

Phyllodes tumors have various growth patterns, with a subset that grows slowly over time and causes local skin breakdown, ulceration, and bleeding. Other atypical invasive lesions that would be possible with this clinical presentation include certain types of sarcoma, which can be locally progressive without systemic spread, and adenoid cystic carcinomas, which are also slow-growing lesions with limited metastatic potential.

PSYCHIATRIC CONSIDERATIONS

In a patient presenting with a long-standing, locally advanced breast tumor, interpersonal and psychiatric dynamics also need to be considered. In some scenarios, the patient may have an established underlying psychiatric illness (e.g., major depressive disorder or schizophrenia) and a history of difficulty in interacting with the health care system owing to inadequately controlled psychiatric illness. In these cases, early engagement and careful ongoing coordination with the psychiatry team is critical, and inpatient hospitalization may be warranted.

This patient presented with a long-standing, neglected breast mass but had normal mental status and appropriate insight and orientation during initial outpatient consultations with the medical oncology, surgical oncology, and radiation oncology teams. She did not have a history of poorly controlled intercurrent psychiatric illness, and she had well-established familial relationships and normal social functioning (i.e., she ran a small business and cared for her child as a single parent). The coronavirus disease 2019 (Covid-19) pandemic posed additional stressors that limited her willingness to access medical care in the period preceding her presentation to the other hospital. In initial conversations with the oncology teams, she expressed distrust of the medical system in a broad sense, but she showed immediate engagement with her care plan and subsequently adhered to her treatment course.

During these initial conversations, it was critical for all team members to inquire about patient motivations and barriers to accessing care without appearing judgmental. Establishing trust and rapport with the patient was important to fostering a long-term care and management plan. Premature and reflexive psychiatry referrals or unintentional countertransference during initial visits have the potential to undermine the therapeutic alliance, which may prompt patients to further retreat from care and may result in additional neglect.

DIAGNOSTIC APPROACH

All patients with neglected breast lesions resulting from presumed invasive processes undergo systemic imaging for tumor staging, along with concurrent tissue sampling for a definitive diagnosis. If abnormal regional lymphadenopathy or suspicious lesions outside the breast and regional lymph nodes are identified, additional tissue sampling in these areas is considered for complete staging, prognostic insight, and therapeutic planning. Locally advanced tumors may have complications, including progressive pain, bleeding, and superimposed infection, which can lead to additional interventions.

In most instances, neglected invasive breast tumors are not readily amenable to upfront surgical excision owing to both cosmetic considerations and difficulties related to removing the tumor to negative margins and adequate skin closure. As a result, the majority of patients receive preoperative systemic therapy. The selection of a specific regimen depends on the tumor phenotype, with consideration given to the use of cytotoxic combination chemotherapy, antiestrogen therapy, immunotherapy, and targeted therapy in specific scenarios. If metastatic disease is identified, the initiation of systemic therapy is also warranted, with the regimen selected on the basis of the breast cancer subtype.

Although most patients with metastatic breast cancer do not pursue definitive local therapy to the breast, some patients with advanced, neglected breast tumors may ultimately start palliative local interventions, even in the presence of metastatic disease. For these patients, the goal of pursuing breast excision or radiation treatment would not be to effect a long-term cure, but rather to improve quality of life and limit the risk of further pain, bleeding, or infectious complications in the breast after a sufficient response to systemic therapy has been observed.

In this case, a detailed plan for systemic and local therapy was dependent on verified pathological results from the incisional biopsy of the breast. The patient's clinical presentation was entirely consistent with a slow-growing, invasive lesion. When evaluating this patient before definitive results of a biopsy were reviewed, I thought low-grade, HR-positive, HER2-negative breast cancer was statistically the most likely diagnosis. However, less common invasive processes, including sarcoma and adenoid cystic carcinoma, were still under consideration.

DR. SETH A. WANDER'S DIAGNOSIS

Slow-growing, invasive breast lesion that is most consistent with low-grade, HR-positive, HER2-negative breast cancer; sarcoma; or adenoid cystic carcinoma.

PATHOLOGICAL DISCUSSION AFTER BIOPSY

Dr. Bayan A. Alzumaili: The incisional biopsy of the breast revealed carcinoma with a cribriform pattern that was infiltrating the dermis, with myxoid

material present within the lumen (Fig. 2A and 2B). The differential diagnosis included adenoid cystic carcinoma and cribriform carcinoma. Immunohistochemical staining of the tumor was positive for p63 in the intact myoepithelial cell layer, as well as for CD117 in luminal epithelial cells (Fig. 2C). These findings are consistent with the two-cell population seen in adenoid cystic carcinoma and rule out cribriform carcinoma. Immunohistochemical staining was also positive for MYB (Fig. 2D). Breast cancer biomarker studies were negative for estrogen receptor, progesterone receptor, and HER2. The pathological diagnosis was adenoid cystic carcinoma.

PATHOLOGICAL DIAGNOSIS

Adenoid cystic carcinoma.

DISCUSSION OF MANAGEMENT

Dr. Wander: On initial evaluation of the patient at this hospital, it became clear that she could not safely pursue even basic wound care and dressing changes at home without the risk of extreme, life-threatening bleeding. Given the locally destructive nature of the tumor, the ongoing risk of bleeding and infection, and the highly atypical pathological features, we opted to form a collaborative multidisciplinary plan in the out-

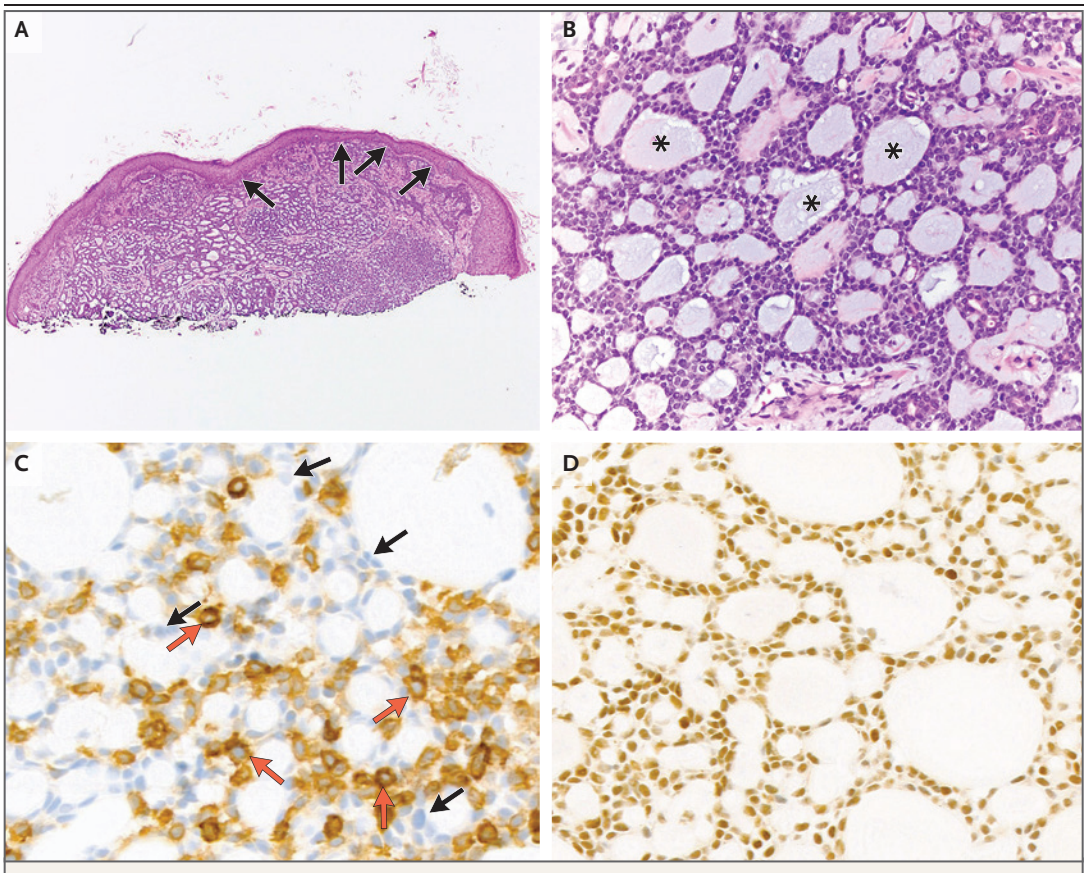

Figure 2. Biopsy Specimen of the Right Breast.

Hematoxylin and eosin staining of an incisional punch-biopsy specimen (Panel A) shows tumor cells infiltrating the dermis and abutting the epidermis (arrows). At higher magnification (Panel B), a cribriform growth pattern is visible, which includes two cell types: luminal epithelial cells surrounded by myoepithelial cells with myxoid material (asterisks) within the lumen. Immunohistochemical staining for CD117 (Panel C) is positive in the epithelial cells (orange arrows) and negative in the myoepithelial cells (black arrows). Immunohistochemical staining for MYB (Panel D) is positive in the tumor cells.

patient setting with ongoing input from the breast medical oncology, radiation oncology, head and neck oncology, and surgical oncology teams.

RADIATION ONCOLOGY

Dr. Daniel E. Soto: Radiation therapy has a well-established role in the adjuvant treatment of ductal and lobular breast cancers. Multiple randomized trials have shown that adjuvant radiation therapy is associated with increased local control after lumpectomy or mastectomy. In addition, a meta-analysis conducted at the University of Oxford showed that adjuvant radiation therapy reduced the risk of death from breast cancer.[4] In the context of breast adenoid cystic carcinoma, radiation therapy has also been shown to have a benefit with respect to both local control and survival after lumpectomy.[5,6] However, given the rarity of the disease, the role of radiation therapy in the treatment of unresectable, locally advanced adenoid cystic carcinoma of the breast is not well established.

In patients with unresectable adenoid cystic carcinoma of the head and neck, concurrent use of chemotherapy and radiation therapy has been shown to increase local control, with a response observed in more than 80% of patients.[7,8] However, in one study, approximately 20% of patients did not have local control after definitive chemotherapy and radiation therapy.[8] Neoadjuvant radiation therapy, which is used less often, can be performed in an attempt to convert locally advanced breast cancer into resectable disease.[9]

In this patient, whole-breast radiation therapy was initiated urgently, with treatment goals including hemostasis, local tumor control, and conversion to a resectable disease state. She received three-dimensional conformal photon radiation therapy, which was administered 5 days per week over a 7-week period for a total dose of 70 Gy in 35 fractions. She also received concurrent cisplatin chemotherapy. Radiation therapy targeted the breast, chest wall, and axilla on the right side with the use of a tangential beam arrangement. On the basis of the low incidence of nodal spread or failures in patients with adenoid cystic carcinoma of the breast, elective nodal radiation therapy beyond the axilla was not administered.[5,10] Adjacent areas of skin that were not involved by the tumor were treated with topical mometasone to reduce the risk of radiation-induced moist desquamation.[11] Toward the end of treatment, tumor malodor was treated with topical metronidazole cream.[12] Expected side effects of radiation therapy developed in the patient, including breast tenderness, skin erythema, and focal moist desquamation.

HEAD AND NECK ONCOLOGY

Dr. Lori J. Wirth: When a patient presents with a histologic subtype of cancer that is atypical for the primary site, the staging system for the primary site can still be used. Therefore, this patient presented with stage IV adenoid cystic carcinoma of the breast (cT4b, cNX, cM1).[13] Lymph-node involvement was considered to be equivocal; involvement of regional lymph nodes in the cribiform variant of adenoid cystic carcinoma is very unusual. Thus, the lymph nodes shown on chest CT may have reflected reactive lymphadenopathy.

Figure 3. Initial Clinical Photograph.
A clinical photograph obtained at the time of the initial examination in the operating room shows the mass in the right breast. The nipple–areolar complex is absent, and most of the skin is ulcerated with areas of malodorous necrotic tissue, seepage, and visible varicosities.

Figure 4 (facing page). Clinical Photographs Obtained during Treatment.

At the time of an intraoperative dressing change, while the patient was undergoing chemotherapy and radiation therapy, the breast mass shows increased granulation tissue and decreased necrosis (Panel A). Five days after completion of radiation therapy, extensive skin desquamation is visible (Panel B). On the operating room table, immediately preceding mastectomy, the mass is decreased in size with resolution of acute radiation changes and decreased necrosis (Panel C). After the mastectomy, the resulting defect is not amenable to primary closure (Panel D). Temporary closure of the mastectomy defect is completed with the use of a vacuum-assisted closure device (Panel E). The delayed definitive closure of the wound is completed with the use of a latissimus dorsi flap (Panel F).

Adenoid cystic carcinoma is a secretory-gland cancer that most commonly arises in the major or minor salivary glands of the head and neck, accounting for approximately 1% of all head and neck cancers.[14] Adenoid cystic carcinoma less commonly arises in secretory glands outside the salivary glands, such as a lacrimal gland, Bartholin's gland, or gland in the tracheobronchial tree, breast, or external auditory canal. Because the histopathological features, molecular features, and disease course of primary adenoid cystic carcinomas that arise outside the salivary glands parallel those of primary disease of the salivary glands, the treatment approach for extra–salivary-gland primary adenoid cystic carcinoma is based on the principles established for the more common salivary-gland primary disease.

The preferred approach for the treatment of adenoid cystic carcinoma is complete surgical resection followed by adjuvant radiation therapy with or without concurrent chemotherapy, even in a patient with low-volume metastatic disease, given the indolent nature of most adenoid cystic carcinomas, long survival times, and desire to achieve long-term local control.[15] Although adenoid cystic carcinoma is not a chemotherapy-sensitive cancer, platinum-based concurrent chemotherapy is often added to the treatment regimen for radiation sensitization, particularly in patients with unresectable disease, on the basis of retrospective cohort studies that showed better local control with chemoradiotherapy than with radiation therapy alone.[16,17] Thus, this patient was treated with intravenous cisplatin at a dose of 40 mg per square meter of body-surface area, administered weekly during the 7-week course of radiation therapy. The patient completed the full course of treatment, without any breaks in therapy.

SURGICAL ONCOLOGY

Dr. Rebecca M. Kwait: After initiation of neoadjuvant chemotherapy and radiation therapy, the patient presented to the breast surgery clinic with a pressure dressing that had been placed 10 days earlier. Owing to ongoing seepage, odor, and discomfort, a dressing change was recommended. Given the risk of recurrent bleeding and pain, the dressing change was scheduled to take place in the operating room, where resources such as cautery, suture ligatures, hemostatic agents, and blood for transfusion would be available, if needed.

An examination performed while the patient was under anesthesia revealed a fungating, exophytic mass, measuring approximately 15 cm by 15 cm, with multiple areas of necrosis. The mass involved the entire right breast, with obliteration of the nipple–areolar complex (Fig. 3), and it appeared to be substantially larger than the left breast. The mass was not obviously fixed to the chest wall but involved most of the skin of the breast. Multiple varicosities could be seen within the superficial tissue. The area was irrigated, and minimal oozing was controlled with hemostatic gauze. A clean pressure dressing that consisted of nonadherent petroleum gauze, fluff gauze, and an elastic wrap was applied.

Throughout treatment with chemotherapy and radiation therapy, the patient underwent serial dressing changes under anesthesia, with irrigation and débridement of the necrotic ulcers (Fig. 4A and 4B). Topical metronidazole cream was applied to the ulcerated areas to help control odor, and dressing reinforcement was performed by the patient to reduce seepage. She eventually started to perform dressing changes at home with assistance from visiting nurses, which made it possible for her to shower in between dressing applications.

Definitive treatment with right total mastectomy was planned. Given the large mass and the extent of skin involvement, the patient was referred to plastic surgery services preoperatively to discuss wound closure. Because of the possibility of positive surgical margins, which would warrant further skin resection, total mastectomy with delayed wound closure was recommended.

The patient underwent right total mastectomy in which a wide excision was performed around all palpable mass, down to the muscle (Fig. 4C and 4D). This created a defect measuring 16.0 cm by 11.0 cm, over which a dressing was placed with the use of vacuum-assisted closure (Fig. 4E). Axillary staging was not performed since this was a palliative procedure with suspicion for metastatic disease. The patient was discharged from the hospital and returned electively to change the vacuum-assisted closure dressing before follow-up with plastic surgery services.

PATHOLOGICAL DISCUSSION AFTER SURGERY

Dr. Alzumaili: The gross mastectomy specimen contained a well-circumscribed, lobulated, firm, tan mass, measuring 15.0 cm by 13.0 cm by 6.5 cm. Microscopic examination revealed islands of cystic glandular structures with central cribriform and peripheral tubular growth patterns, eosinophilic and myxoid material within the lumen, and surrounding dense fibrotic stroma (Fig. 5A). The tumor focally invaded the epidermis. No evidence of tumor necrosis, solid architecture, perineural invasion, lymphovascular invasion, or high-grade transformation was present. Surgical margins were negative for carcinoma. Molecular detection by means of a solid-tumor fusion assay revealed an *MYB::NFIB* gene fusion (with :: indicating fusion) (Fig. 5B). The final pathological diagnosis was adenoid cystic carcinoma with *MYB::NFIB* gene fusion.

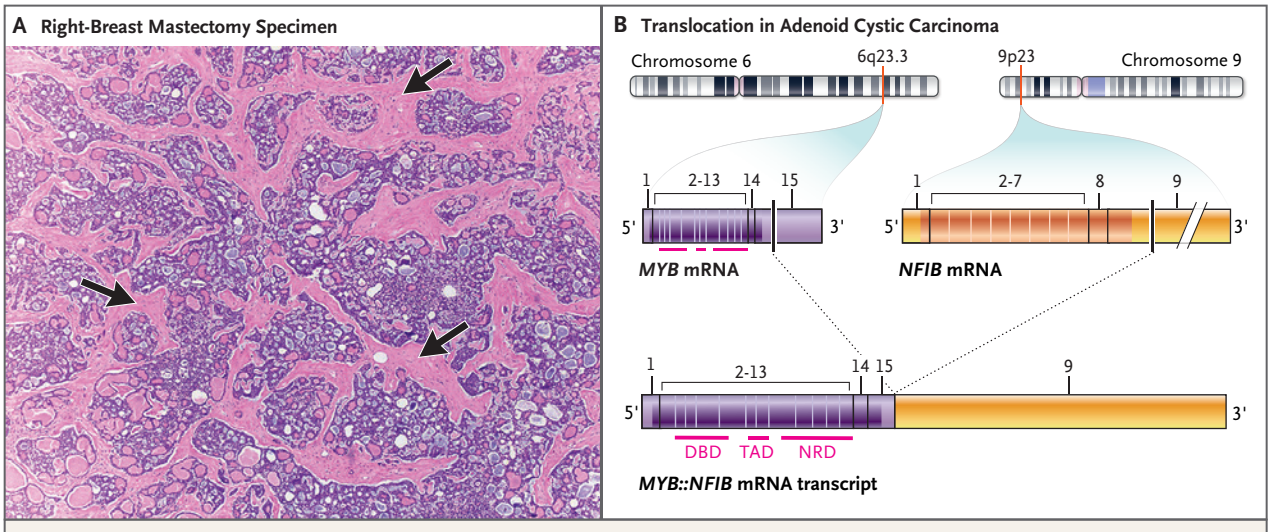

Figure 5. Mastectomy Specimen of the Right Breast and Solid-Tumor Fusion Assay Representation.

On hematoxylin and eosin staining, a mastectomy specimen of the right breast (Panel A) shows islands of cystic glandular structures with central cribriform growth patterns and peripheral tubular growth patterns (not shown), eosinophilic and myxoid material within the lumen, and surrounding dense fibrotic stroma. A schematic representation (Panel B) shows the translocation of *MYB* and *NFIB* in adenoid cystic carcinoma (drawing not to scale). In this patient, a fusion transcript was identified involving *MYB* exon 15 and *NFIB* exon 9. *MYB* is an oncogene and *NFIB* is a transcription factor. The *MYB::NFIB* gene fusion (with :: indicating fusion) results in overexpression of the MYB protein, which upregulates genes involved in cell-cycle control, apoptosis, cell growth and angiogenesis, and cell adhesion. DBD denotes DNA-binding domain, TAD topologically associated domain, and NRD negative regulatory domain.

Dr. Kwait: After pathological confirmation of negative margins, the plastic surgery service performed partial wound closure with vacuum-assisted closure to decrease the size of the defect. Delayed definitive wound closure with the use of a latissimus dorsi flap was subsequently performed (Fig. 4F). She was discharged on postoperative day 3.

FOLLOW-UP

Dr. Wirth: The patient recovered well. Four months after her last surgery, the pain had decreased substantially. She was participating in occupational and physical therapy, with improved neurologic function after her previous stroke and fewer physical limitations related to her cancer treatment. CT of the chest revealed a new left-upper-lobe nodule (measuring 0.5 cm), as well as enlargement of pulmonary nodules, including a right-lower-lobe nodule (from 1.1 cm to 1.8 cm) and a left-lower-lobe nodule (from 0.4 cm to 1.2 cm). Active surveillance was continued. Nine months after the last surgery, the patient was pain-free and asymptomatic, apart from subtle cognitive and language deficits. CT of the chest revealed further enlargement of the lung nodules, which measured 0.6 cm in the left upper lobe, 2.5 cm in the right lower lobe, and 1.5 cm in the left lower lobe. CT-guided fine-needle aspiration of the right-lower-lobe nodule confirmed the presence of metastatic adenoid cystic carcinoma without dedifferentiation to a more aggressive histologic subtype. Next-generation sequencing revealed *MYB::NFIB* gene rearrangement and an *EZH2* T646C mutation, which is considered to be a variant of unknown clinical significance. Currently, no systemic therapies have been approved for the treatment of recurrent or metastatic adenoid cystic carcinoma. The patient was referred for participation in a phase 1 industry-sponsored clinical trial.

FINAL DIAGNOSIS

Metastatic adenoid cystic carcinoma, originating in the breast.

This case was presented at Cancer Center Grand Rounds.

Disclosure forms provided by the authors are available with the full text of this article at NEJM.org.

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