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Scientific letter

Chest wall osteomyelitis after breast cancer surgery. A case series

Osteomielitis de la parrilla costal en pacientes posoperadas de cáncer de mama. Una serie de casos

To the editor,

Patients with locally advanced breast cancer receiving preoperative chemoradiation have a 45% surgical complication rate including surgical site infection, dehiscence and flap necrosis.[1] Secondary chest wall osteomyelitis (CWO) is an infrequent, poorly described event, usually a complication of cardiothoracic surgery. After breast surgery, it has been described anecdotally.

The aim of this study was to describe a follow-up case series of patients who presented with CWO after mastectomy. Between January 2005 and August 2010, eleven patients developed CWO. Ten had tumors >5 cm, 4 (36.3%) were ulcerated at diagnosis; 10 had locally advanced breast cancer, and 1 metastatic disease. Bone scans (^{99}mTc-MDP) prior to treatment were negative for bone

Table 1
Clinical, microbiology and outcome information related to chest wall osteomyelitis in patients with breast cancer.

#	Surgical procedure	Nec.	Deh.	SSI	Culture	Antibiotics	CWO outcome	Cancer outcome
1	Patey RMM	–	+	+	Negative	Cipro + rif	Resolved 25 weeks	Alive without cancer DSF 3.96 years
2	Madden RMM	+	–	+	MS *S. epidermidis*	Cipro + clindamycin	Resolved 14.5 weeks	Dead. (overall survival: 4.12 years) DFS: 2.2 years
3	Madden RMM	–	+	+	MS *S. aureus*	Cipro + rif	Resolved 16 weeks	Alive without cancer DFS: 4.02 years
4	Madden RMM	+	–	+	–	Cipro + rif	Resolved 16 weeks	Alive without cancer DFS: 4.08 years
5	Madden RMM	+	–	+	MS *S. aureus* *K. pneumoniae*	Cipro + rif	Resolved 13 weeks	Alive without cancer DFS: 4.42 years
6	Patey RMM	+	–	+	MS *S. aureus* *C. albicans*	Cipro	Resolved 12 weeks	Alive without cancer. DFS: 4.37 years
7	Patey RMM	+	–	+	*P. aeruginosa*	Cipro	Improved persists with osteomyelitis	Alive without cancer DFS: 5.64 years
8	Madden RMM	+	–	+	*E. coli*	Cipro + rif	Resolved 24 weeks	Alive with cancer. DFS: 1.9 years Overall survival: 5.7 years
9	Patey RMM	+	–	+	Quinolone-resistant *P. aeruginosa*	Ceft + prob	Resolved 16 weeks	Alive with cancer DFS: 2.9 years Overall survival: 7.4 years
10	Madden RMM	+	–	+	*P. aeruginosa*	Cipro + rif	Resolved 22 weeks	Alive with cancer DFS: 6.7 years
11	Halsted RM	–	+	+	*S. pyogenes*	Oflox	Resolved 12 weeks	Lost to follow-up DFS: 2.45 years

RMM, radical modified mastectomy; RM, radical mastectomy; Nec, necrosis; Deh, dehiscence; SSI, surgical site infection; CWO, chest wall osteomyelitis; Cipro: ciprofloxacin; Rif, rifampin; Ceft, ceftibuten; Prob, probenecid; Oflox, ofloxacin; DFS, disease free survival (from cancer diagnosis to recurrence or metastasis. In patients without recurrence or metastasis is as well, overall survival).

metastasis in all cases. Patients received anthracycline based neoadjuvant chemotherapy; none had an adequate clinical response. Nine were treated with concomitant chemoradiation and 2 received preoperative radiation; ten (91%) developed radioepithelitis. All, except one underwent modified radical mastectomy.

Patients with a non-healing wound and excruciating pain in 1 or more costal arches, not responding to standard clinical care were evaluated for CWO. Ten patients underwent radionuclide bone scan with ^{99}m Technetium-Ubiquicidin (^{99}mTc-UBI) and 1 with ^{99}mTc-MDP, being abnormal in all cases. Wound cultures were obtained through swab technique in 10 (91%) patients. The most common pathogens were: *Staphylococcus aureus* (3, 33.3%) and *Pseudomonas aeruginosa* (3, 33.3%). At CWO diagnosis, 8 (88.8%) were treated with ciprofloxacin + rifampin, 3 with ciprofloxacin, and one with ceftibuten + probenecid. Mean duration of treatment was 19.8 weeks. Four patients (36.4%) underwent surgical lavage, 2 required infected rib extraction, and 2 underwent split thickness skin grafting for defect covering. CWO resolved in 10/11 patients. In Table 1, clinical, microbiology data and outcome related variables are shown for each case.

There are few reports of late CWO occurring years after breast irradiation.[2] To the best of our knowledge, this is the first report of CWO after surgery in patients with breast cancer.

Patients described in this series share multiple characteristics. Most were women with tumors greater than 5 cm, without an adequate response to neoadjuvant chemotherapy that further received concomitant chemoradiation and underwent radical surgery. During the postoperative period, all developed major surgical wound complications.

Diagnosis of CWO in previously radiated patients remains a challenge. Bone biopsies for culture are barely available, and osteonecrosis can mimic a bone infection. ^{99}mTc-UBI scintigraphy has been used in our Institution for several years for evaluating osteomyelitis. ^{99}mTc-UBI scintigraphy is an antimicrobial peptide, which selectively binds the bacterial wall and allows discrimination between inflammation and infection,[3–7] most useful in these patients. Clinical studies have reported 96% sensitivity and 100% specificity[3,8] when compared with conventional Tc-MDP scans and bone biopsy; however, its efficacy has not been proved in large randomized controlled trials.

Treatment of chronic osteomyelitis is challenging. Despite continued research, most aspects of antibiotic treatment are still poorly understood.[9] In our series, most of the patients (88.8%) were treated with oral ciprofloxacin, which has excellent bioavailability and bone penetration. In 8 patients, a combination of ciprofloxacin + rifampicin was used, as rifampin enhance fluorquinolone regimens for staphylococci and to prevent resistance.[10]

This report has several limitations. As in any retrospective study some data was missing and different clinicians treated these patients. Although considered as the gold standard for osteomyelitis diagnosis, we were unable to obtain a bone biopsy for culture in any patient due to the high morbidity related to costal arch sampling in irradiated tissue. In these patients, there is an increased risk of a non-healing wound. Despite these biases, the high specificity of ^{99}mTc-UBI scintigraphy, along with clinical improvement, and a decrease on inflammatory markers, supports CWO diagnosis.

CWO is uncommon, but is likely underestimated. It increases health-care costs and produces such disability that warrants timely recognition. This study provides information for clinicians involved in the treatment of patients with advanced breast cancer, wound complications and CWO.

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Varón brasileño de 19 años con anemia ferropénica grave

A 19 year old Brazilian male with severe iron deficiency anemia

Sr. Editor:

La uncinariasis es una geohelmintiasis intestinal causada por nematodos hematófagos de la familia *Ancylostomidae* («boca con ganchos»), principalmente *Ancylostoma duodenale* y *Necator americanus*, común en áreas tropicales y subtropicales, y que actualmente afecta a unos 740 millones de personas en el mundo (más del 10% de la población mundial)[1,2]. En el siglo XIX y principios del XX se describió en Europa, incluyendo nuestro país, la denominada «anemia de los mineros», producida por *A. duodenale*[3]. Los gusanos adultos miden alrededor de 1 cm de largo, según las especies, y presentan una cápsula bucal quitinosa[1]. Hoy día, la importancia de la uncinariasis en nuestro medio es como enfermedad importada[4–6]. Presentamos el caso de un paciente con anemia ferropénica grave secundaria a uncinariasis intestinal.