Surgical Site Infections in Breast Surgery for Primary Cancer: Could it Lead to Different Oncologic Outcome? The Potential of Administrative Data Flows in the Study of a Large Population

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EDITORIAL

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Surgical site infection represents a serious and generalized problem, that could lead to significant morbidity, a high rate of re-operation and antibiotic treatment, with the consequent delay in wound healing and the risk of a systemic spread of the infection 1. Breast surgery is normally classified as a category of clean operations (Table 1), such as hernioplasty and thyroid surgery. However, surgical wound infection rates in the literature are about 3-15%, which is a little higher if we consider other interventions classically considered "clean" (between 1.5 and 3%) [2, 3]. Other authors report slightly lower surgical site infection rates in breast cancer (range 2-4.3%) [4]. These differences can be justified by the opening of the ductal system during surgery, bringing it into communication with the external environment. The incidence of wound complications after breast cancer surgery increases if axillary surgery [5] is performed. A superficial surgical site infection is defined as "infection that occurs within 30 days after the operation and involves only the skin and subcutaneous tissue of the incision which is associated with at least one of the following:

• purulent drainage of the surgical site;

• bacteria isolated from a culture obtained aseptically of fluid or tissue from the surgical site;

• at least one of the following signs or symptoms of infection: pain, localized swelling, redness or positive heat touch1.

In 2013 a randomized study has revealed the advantage in the use of pre-operative antibiotic prophylaxis in breast surgery (especially in obese patients) in the prevention of surgical site infection with a follow-up of 30 days [6]. Because of the high number of surgical procedures performed annually, the problem of surgical site infection is quite important, also considering the high economic costs. There are numerous studies that demonstrate how it is possible to reduce the risk of surgical site infections, through the adoption of intervention programs that include continuous surveillance and periodic data feedback [7, 8].

For these reasons, in 2005, the Health and Social Agency of the Emilia-Romagna Region (Italy) launched a project for the development of a permanent surveillance system for surgical site infections (SIChER). SIChER is based on the European Surgical Site Infection Surveillance Protocol (HAI-SSI), defined and updated by the ECDC (European Center for Diseases Prevention and Control), which uses the classification of procedures in intervention categories

proposed by the NHSN (National Healthcare Safety Network).

This project involves a large number of patients and is my opinion that this administrative data flows could be useful also in some branches of surgery especially with a high number of standardized clean operations, like oncologic breast surgery. A statistical difference of the risk-rate infection between the two methods of hospitalization (Ordinary Hospitalization versus Day Surgery) with the analysis of the economic impact will be carried out and the production of a Score will be assessed for the identification of the profile of patients suitable for One Day Surgery. Another aspect is the risk-rate infection in the use of IORT (intra-operative radiotherapy) respect to standard radiotherapy.

Finally, it could be an attempt to find a risk-relation between surgical site infection and local relapse of breast cancer. To date, in fact, there are no researches in the literature that is able to correlate these two aspects. We found only a single study (Murthy, B. L. et al. Cancer 2007) in the English literature where inflammations are recognized as a 5 years risk factor of relapse in breast cancer, but authors did not find statistical evidence of local relapse.

In our Institution, we will retrospectively analyze the SichER database in oncologic breast surgery. Furthermore, the number of biases in this study is low because we use a dedicated operation room for breast surgery and we have a low number of dedicated breast surgeons with large cases.

In conclusion is my belief that breast surgery represents the best model to study the consequences of a surgical site infection in oncology because of the short length hospital of stay, the use of a simple, high standardization surgery performed only in reference Centres by the surgeons with large cases.

Table 1: Garner, J. S. (1986). CDC Guideline for Prevention of Surgical Wound Infections, 1985. Infection Control, 7(03), 193–200.

Clean Wounds	These are uninfected operative wounds in which no inflammation is encountered and the respiratory, alimentary, genital, or uninfected urinary tracts are not entered. In addition, clean wounds are primarily closed, and if necessary, drained with closed drainage. Operative incisional wounds that follow nonpenetrating (blunt) trauma should be included in this category if they meet the criteria.
Clean-Contaminated Wounds	These are operative wounds in which the respiratory, alimentary, genital, or urinary tract is entered under controlled conditions and without unusual contamination. Specifically, operations involving the biliary tract, appendix, vagina, and oropharynx are included in this category, provided no evidence of infection or major break in technique is encountered.
Contaminated Wounds	These include open, fresh, accidental wounds, operations with major breaks in sterile technique or gross spillage from the gastrointestinal tract, and incisions in which acute, nonpurulent inflammation is encountered.
Dirty or Infected Wounds	These include old traumatic wounds with retained devitalized tissue and those that involve existing clinical infection or perforated viscera. This definition suggests that the organisms causing postoperative infection were present in the operative field before the operation.

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