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Medicolegal aspects

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Iatrogenic subcutaneous emphysema in aesthetic breast augmentation. Medicolegal aspects

The aim of the present study was to investigate clinical results and medico-legal aspects related to the surgical procedure of mini breast augmentation. In the present case, a 28-year-old young woman with bilateral mammary hypoplasia underwent surgery, under local anesthesia, with the placement of 150 cc breast implants in the sub-glandular plane. We report a case of dramatic isolated subcutaneous emphysema without pneumothorax and pneumomediastinum to be related in terms of a causal link to the surgical procedure which the patient underwent. The plastic surgeon proceeded to replace a breast implant that presumably, represented the vehicle of transmission of the suspected pathogen responsible for the infection, to become a causal role for the infectious manifestation. This case report is an emblematic example of the need for a careful and correct surgical procedure, in order to avoid serious consequences as in the case in question, burdened by the occurrence of unsafe conditions for the patient. Compliance with the guidelines and the technical datasheet of breast implants is essential in order to avoid the concrete hypothesis of professional liability.

KEY WORDS: Aesthetic breast augmentation, Breast implant, Iatrogenic subcutaneous emphysema

Introduction

Aesthetic breast augmentation is one of the most commonly performed procedures in plastic surgery, in order to improve the appearance of the breasts. Surgical technique varies in relation to the site of the skin incision, site of implantation, shape and volume of the prosthesis. As is well known, any surgical procedure involves the unpredictable possibility of general complications. However, a correct preoperative anamnestic-clinical and instrumental study can considerably reduce these events. Complications related to the aesthetic breast augmentation described in the scientific literature are different: it is possible to distinguish in general and specific complications, early and late, or in relation to the prosthetic material (autogenous or allogeneic) and the type of technique used. General complications include bleeding-hemorrhage, hematoma, seroma, postoperative infections, dehiscence of the surgical wound, and rarer necrosis of the skin and/or nipple-areola complex. Specific complications include retraction of the periprosthetic capsule, rupture of the prosthesis, displacement of the prosthesis due to dislocation and/or rotation, exposure of the prosthesis, cutaneous dysesthesia, Mondor syndrome and postoperative expansion of the prosthesis [1-5].

Pneumothorax with subcutaneous emphysema is a known complication, of rare occurrence, resulting particularly in anesthetic or surgical procedures [6-9]. Instead, it is rare to find isolated subcutaneous emphysema. In the present case, we report a dramatic isolated subcutaneous emphysema without pneumothorax and pneumomediastinum to be related in terms of a causal link to the surgical procedure of mini- breast augmentation, which the patient underwent.

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Case Report

A 28-year-old young woman, normotensive, on oral contraceptive therapy, a moderate smoker, underwent a surgical consultation for bilateral mammary hypoplasia. During the preoperative clinical interview, in agreement with the patient, it was chosen a mini-breast augmentation with the placement of 150 cc breast implants in the sub-glandular plane, as shown in the preoperative informed consent form.

The patient underwent surgery in a private clinic under local anesthesia and sedation, through a submammary incision, preparation of the sub-glandular pocket and placement of sterile, single-use, round, textured, high-profile prostheses, 245 cc each.

In the following 12 hours, the patient developed painful swelling and hematoma in the right breast, therefore, reassessed on the same day by the same surgeon, she underwent a surgical procedure, under general anesthesia for the evacuation of the hematoma, removal and replacement of the right prosthesis and drainage positioning.

In the following 24 hours, the clinical conditions suffered a rapid deterioration, with the onset of general malaise, high fever, severe pain and hyperesthesia of the thoracoabdominal wall. Therefore, the woman was urgently transported to the emergency room of the local hospital, where tachypnea, dyspnoea, diffuse crackles, bilateral mammary edema and erythema, swelling of the soft tissues of the chest and abdomen were observed, placing the diagnosis of widespread post-surgical subcutaneous emphysema. A CT scan performed the same day showed the presence of free air in the subcutaneous tissue, interposed in the pectoral muscles, in the axillary bilaterally and in the abdominal subcutaneous tissue. The instrumental examinations excluded the presence of pneumothorax and pneumomediastinum; therefore, diagnostic suspect of breast implants infection was placed. Following the worsening clinical conditions, the patient was transferred to the Plastic Surgery department, and she underwent surgery, in urgency, to remove the implants. During surgical skin incision, there was a release of air under tension; sieroematic fluid was detected in the prosthetic pockets, and on the left side, the presence of Vicryl sutures extended from the small pectoral muscle to the periosteum of the rib was observed. At the same time, samples and swabs of serum blood were collected, and the prostheses were sent for a microbiological and cultural exam. After consultation of infectious diseases specialist, antibiotic therapy was instituted with Ampicillin/ Sulbactam, Clindamycin and Ampicillin for the suspect of Clostridium Perfrigens infection. The following day a contrast-enhanced CT scan was performed, showing a substantially unaltered condition compared to the previous control on subcutaneous emphysema. At the same time, the pulmonary condition appeared to be worsened with the presence of focal areas of parenchymal thickening with air bronchogram, suspected for an initial lung infection with a simultaneous increase in PCR values and number of neutrophils. After an infectious and pneumatological assessment, the ongoing therapy was suspended and replaced with Tigecycline and Piperacillin/tazobactam. Samples and swabs sent for microbiological and cytological examination did not permit the isolation of pathogens and, therefore, the setting of antibiogram-based therapy. The following days, after the appearance of side effects such as nausea, vomiting, and diarrhea, and after an infectious consultation, Tigecycline was replaced with the prescription of Clindamycin associated with Piperacillin/Tazobactam and improvements in clinical conditions, blood values, and instrumental examinations were observed. On the fourth postoperative day, the drainage was removed, and after further pneumatological consultations, on the tenth postoperative day, the patient was discharged in good general conditions, apyretic with a prescription of first-generation Cephalosporin and Azithromycin.

Discussion and comments

This case report is an emblematic example of the need for a careful and correct surgical procedure, in order to avoid serious consequences as in the case in question, burdened by the occurrence of subcutaneous emphysema and unsafe conditions for the patient. Among the known complications of breast augmentation, pneumothorax represents a complication not frequently reported in literature, although, in clinical practice is more frequent than underlined [10]. Despite, is difficult to identify the causes, pneumothorax is related to: intraoperative pleural lacerations (43%), perforation with the local anesthesia needle (37%), spontaneous rupture of pulmonary blebs during and after the surgical procedure (16%), related to a high ventilation pressure during the anesthetic procedure (3%). Instead, a single clinical case of bilateral subcutaneous emphysema without pneumothorax, in a patient who underwent bilateral breast augmentation was described [11]. This case report highlights how an isolated finding of subcutaneous emphysema can be considered a sign "innocent" / not worrying in a verified absence of pneumothorax and the presence of a good general condition of the patient. Also, infection of the implants is a known complication, with about 2.9% of cases, related to perioperative risk factors, patient conditions and surgical technique used. It is distinct in acute (1.7%) or late (0.8%) [12]. The most common bacteria responsible for the infection are Staphylococcus Epidermidis, Staphylococcus Aureus, Escherichia, Pseudomonas, Propionibacterium and Corynebacterium. Rarer, but no less severe, are infections with anaerobic bacteria, such as Clostridium Perfrigens. A study underlined an infection risk of 0.74% in breast implants, 3.23% in reconstructive surgery fol-

lowing breast cancer and 0.27% in aesthetic surgery [13]. Infection is the most common cause of readmission for antibiotic therapy, removal of implants or drainage [14]. Several studies focused on the identification of risk factors, identifying: BMI, diabetes, smoking, repeated repositioning of implants, the formation of hematoma or seroma and the use of drainage [15,16]. Determining the origin of the infection is difficult because there are different potential sources, such as contaminating the implants, the same surgical procedure, or an infection from a remote site [17-18]. Also, 2/3 of infections develop in the acute post-operative phase, while the remaining 1/3, in the period following the surgical operation, even years and decades later [19]. In literature, it was described, a case of late infection of breast implants with Clostridium Perfringens, a common anaerobic pathogen present in the gastrointestinal tract, after extensive dental treatment [20] and a case of surgical infection following excision of a breast mass sustain by Clostridium Sordellii [21]. Also, several cases of infection with Pyoderma Gangrenosum [22]. Candida Albicans [23], Mycobacterium Conceptionense [24] and Mycobacterium jacuzzi [25], in the latter case due to the possible passage of the germ man-man or present on the skin of the patient during the surgical procedure. A study of 139 implants removed in symptomatic patients was reported. Different bacteria involved, including Clostridium perfringens: culture test was positive in 47% of cases [26]. From the analysis of the specific case, it is possible to highlight different critical issues during the operating phase under the medical-legal profile:

– Correct preoperative planning;

– Although "the informed consent protocol for mini-breast augmentation" indicated the use of "small prostheses of maximum 150 cc to achieve an increase up to one size", during the operation, breast implants of 245 cc were placed.

– *On the left side*: "Vicryl sutures on the pectoralis minor muscle up to the periosteum of the rib" were performed. Sutures on the muscular planes are not expected in the mini-breast augmentation technique. This can be framed as the result of an incongruous surgical procedure during the preparation of the sub-glandular pocket, in which an iatrogenic laceration of the muscular planes took place. Therefore, surgical synthesis (which does not appear in the two operative reports) was necessary, or even more, incorrect positioning of internal stitches.

– *On the right side*, the single-use medical device, probably non-sterile, was removed and replaced. Therefore, the permanence of the breast implant in the surgical site took place.

– Despite the occurrence of a new "event" (post-surgical hematoma), the surgeon entirely entrusted the patient with the independent control of drainage: leaving the same to perform "photo drainage every 12 hours" with clinical control by medical staff extended to the next 24 hours, to indicate imperishable management of the specific case both in the surgical phase and in the post-operative management.

In the presence of subcutaneous emphysema, the diagnostic suspicion of an infection of the surgical site by anaerobic bacterial agents, such as Clostridium perfringens, was placed. So that, from admission, antibiotic therapy that included specific pharmaceutical species also for this microbial agent was prescribed.

The main causes of infection related to breast augmentation are generally: a violation of asepsis techniques, poor accuracy of the maintenance of intra-operative sterility [27], a poor hygienic condition of the operating room or surgical instruments or prostheses inserted.

Conclusion

In the present case, the plastic surgeon proceeded to replace a breast implant that presumably, represented the vehicle of transmission of the suspected pathogen responsible for the infection, to become a causal role for the infectious manifestation. Compliance with the guidelines and the technical datasheet of prosthetic implants is essential in order to avoid the concrete hypothesis of professional liability for negligence and inexperience, as in the present case.

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Riassunto

Lo scopo del presente studio è stato quello di esaminare i risultati clinici e gli aspetti medico-legali correlati alla procedura chirurgica di mini-mastoplastica additiva. Nel presente caso, una giovane donna di 28 anni con ipoplasia mammaria bilaterale è stata sottoposta a intervento chirurgico, in anestesia locale, con il posizionamento di protesi mammarie da 150 cc a livello del piano sub-ghiandolare. Segnaliamo il verificarsi di un drammatico enfisema sottocutaneo isolato in assenza di pneumotorace/ pneumomediastino da relazionare in termini di nesso causale al trattamento chirurgico a cui la donna fu sottoposta. Il presente case report costituisce esempio emblematico della necessità di una attenta e corretta esecuzione tecnica dell'atto operatorio, eseguito a fini estetici, onde scongiurare gravi conseguenze come nel caso in oggetto, gravato dal verificarsi di condizioni non sicure per la paziente. Nel caso di specie il chirurgo plastico procedette a reinserire una componente protesica che,

verisimilmente, ha rappresentato il veicolo e la via di trasmissione del patogeno sospettato responsabile d'infezione, così da assurgere a ruolo causale per il concretizzarsi della manifestazione infettiva. Essenziale l'adeguamento alle linee guida ed alla scheda tecnica degli impianti protesici al fine di evitare la concreta ipotesi di responsabilità professionali.

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