



Analysis of Malpractice Claims Associated with Surgical Site Infection in the Field of Plastic Surgery

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Postoperative infections are rare after plastic surgery; however, when present, they can affect the aesthetic outcome. Currently, many malpractice lawsuits are associated with surgical site infection. The present study aimed to analyze malpractice claims associated with surgical site infection in the field of plastic surgery through a review of Korean precedents. We analyzed the type of procedure, associated complications, and legal judgment in these cases. Most claimants were women, and claims were most often related to breast surgery. The common complications related to surgical site infection were deformity, scar, and asymmetry. Among the 40 cases, 34 were won by the plaintiff, and the mean claim settlement was 2,832,654 KRW (USD 2,636.6). The reasons for these judgements were as follows: 1) immediate bacterial culture tests were not performed and appropriate antibiotics were not used; 2) patients were not transferred to a high-level hospital or the infection control department was not consulted; 3) surgical site infection control measures were not appropriate; and 4) surgical procedures were performed without preoperative explanation about surgical site infection. The number of claims owing to surgical site infection after surgery is increasing. Infection handling was one of the key factors that influenced the judgement, and preoperative explanation about the possibility of infection is important. The findings will help surgeons achieve high patient satisfaction and reduce liability concerns.

Keywords: Nosocomial Infection; Plastic Surgery; Malpractice Litigation; Surgical Site Infection

INTRODUCTION

Surgical site infection (SSI) is the second most common cause of nosocomial infection. It accounts for 14%-16% of all hospital-acquired infections, and its rate is approximately 2.7% (1). The Centers for Disease Control and Prevention (CDC) has developed criteria that define SSI as infection related to an operative procedure that occurs at or near the surgical incision within 30 days of the procedure or within one year if prosthetic material is implanted at surgery (2). SSIs are often localized to the incision site but can also extend into deeper adjacent structures. Several studies have identified the factors related to SSI, and old age, diabetes, steroid use, smoking, and obesity are important patient-related risk factors, while inappropriate surgical site care and intraoperative wound contamination are important surgery-related risk factors (3). Moreover, the operation time and length of hospital stay have been shown to be related to SSI (4). The rate of SSI could be reduced by up to 35% with prevention activities. Even with efforts, such as improvement of operating room facilities, administration of antibiotics as prophylaxis against infection, and improvement of surgical techniques, it is impossible to prevent SSI completely. Postoperative infec-

tions are rare after plastic surgery; however, when present, they can seriously affect the aesthetic outcome. SSI can occur in a clean surgical wound unexpectedly after plastic surgery, and patients usually accuse the surgeon of malpractice and file lawsuits. The present study aimed to analyze malpractice claims associated with SSI in the field of plastic surgery through a review of Korean precedents. We assessed the characteristics of SSI that might lead to medical litigation and specified the liability threshold of physicians for infection in the field of plastic surgery.

MATERIALS AND METHODS

Precedent cases were collected from legal portal sites (Supreme Court Legal Information Service [glaw.scourt.go.kr] and LAWnB [www.lawnb.com]) and Google Scholar, using the search terms 'nosocomial infection,' 'plastic surgery,' 'malpractice litigation,' 'surgical site infection.' A total of 40 cases were identified between 2010 and 2015. The complete text of the judgment documents was obtained after filing an application with the Supreme Court of Korea, and raw data were obtained from the lower courts. Cases were divided into facial surgeries and body surgeries and

were further subdivided into additional categories. Each case was then analyzed to determine the number of individuals that were accused and the institution where the surgery had been performed. Additionally, the associated complications, monetary amounts, and reasons for judgments against plastic surgeons were analyzed. The cases were further evaluated with respect to care standards to determine whether a breach of care standards had occurred.

RESULTS

Forty cases of plastic surgery were associated with SSI during the study period. There were 35 female patients and five male patients. The mean age of the patients was 36 years (range, 24-57 years). The number of medical malpractice claims showed an increasing trend between 2010 and 2015 (Fig. 1). Table 1 shows the distribution of claims across different types of institutions. The highest number of claims concerning care were for primary local clinics (33 cases), and the lowest were for tertiary university hospitals (two cases) (Table 1).

The distribution of the types of procedures associated with the claims was as follows: mammoplasty, 15 cases; body contouring surgery, including abdominoplasty and liposuction, 8 cases; facial rejuvenation, including fat grafting, filler injection, and thread lift, 8 cases; rhinoplasty, 4 cases; facial contouring surgery, 3 cases; and blepharoplasty, 2 cases (Fig. 2).

The three major reasons for the lawsuits were deformity, scar, and asymmetry, regardless of the type of surgical procedure. Analysis of the breast surgery claims showed that the most common reason for a lawsuit was breast augmentation (9 cases), followed by reduction mammoplasty (4 cases) and gynecomastia correction (2 cases) (Fig. 3). There were 23 cases of revision

procedures owing to SSI, and every case among the precedent cases had sequelae after SSI.

Breast surgery was associated with the highest number of SSI cases, and the complications were as follows: disfigurement or asymmetry after breast parenchymal necrosis, 12 cases; scars, 6 cases; loss of nipple areolar, 4 cases; and sensory change, 2 cases. Some patients had multiple complications.

According to wound classification, every precedent case had a clean wound. Microbiology studies are usually performed when SSI is suspected. There were 6 cases without microbiology studies, and these cases occurred in primary local clinics.

Among the 40 precedent cases, 34 were won by the plaintiff (Table 2). The reasons for the judgement were as follows: 1) immediate bacterial culture tests were not performed and appro-

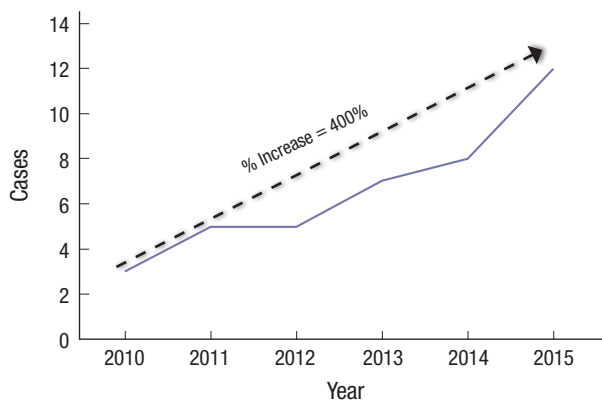


Fig. 1. Distribution of number of precedent cases during 2010-2015.

Table 1. Distribution of claims according to the type of institution

Claims	Primary level local clinics	Secondary level local hospital	Tertiary level university hospital	Total
Plastic surgery	33	5	2	40

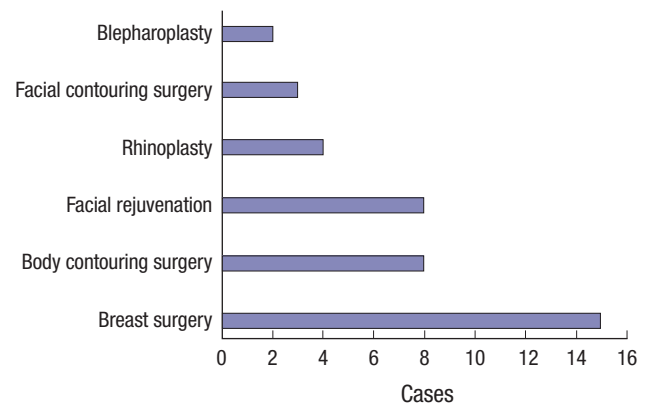


Fig. 2. Distribution of surgical procedure in the subjected precedent cases.

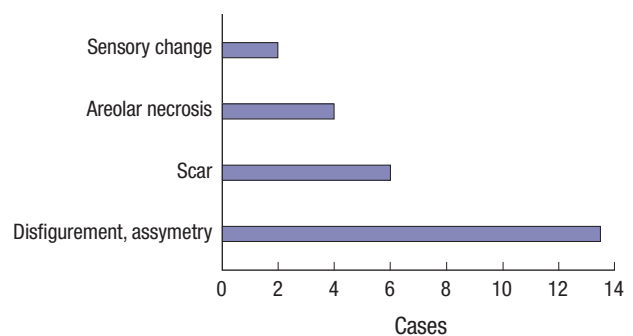


Fig. 3. Distribution of complications in breast surgery related precedent cases.

Table 2. Analysis of surgical site infection claims in the field of plastic surgery

Causes	No. (%) of claims		
	Total	Ruling with defendant	Ruling with plaintiff
Breast surgery	15	2 (13)	13 (87)
Body contouring surgery	9	1 (11)	8 (89)
Facial rejuvenation	8	1 (12)	7 (88)
Rhinoplasty	4	1 (25)	3 (75)
Facial contouring surgery	3	0 (0)	3 (100)
Blepharoplasty	2	1 (50)	1 (50)
Total	40	6 (15)	34 (85)

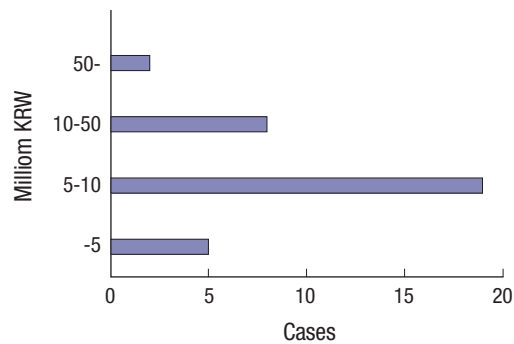


Fig. 4. Distribution of damage compensation.

appropriate antibiotics were not used; 2) patients were not transferred to a high-level hospital or the infection control department was not consulted; 3) SSI control measures were not appropriate; and 4) surgical procedures were performed without preoperative explanation about SSI. Among the 34 cases, there were four cases of malfeasance, five cases of violation of informed consent, and 25 cases of both malfeasance and violation of informed consent. When malfeasance was noted, the liability was limited because the court considered that complete infection prevention is impossible and that patient-related factors can contribute to the aggravation of infection.

When malfeasance was noted, the claim amount ranged from < 10 million KRW (USD 9,308.4) to 600 million KRW (USD 558,480.3), and the mean claim amount was 2,832,654 KRW (USD 2,636.6). The distribution of the claim amount was as follows: < 5 million KRW, five cases; 5-10 million KRW, 19 cases; 10-50 million KRW, eight cases; > 50 million KRW, two cases (Fig. 4).

The distribution of the precedent cases associated with the surgeon's age was as follows: < 35 years, 2 cases; 36-45 years, 21 cases; 46-55 years, 13 cases; > 55 years, 4 cases. When the surgeon's age was divided into two groups—above 35 years and below 55 years and the others—there was significant changes in precedent cases between two groups (Fig. 5).

DISCUSSION

Prevention of SSI is extremely important, as SSI after surgery is associated with mortality, morbidity, prolonged hospital stay, increased need for antimicrobial therapy, and high concomitant costs (5). Additionally, SSI can decrease the quality of life of patients (6). Despite advances in surgical techniques, sterile protocols, and perioperative antibiotic regimens, SSI remains a significant problem (7-10). Although the risk of infection is very low after plastic surgery, when SSI occurs after plastic surgery, the patient generally does not accept the occurrence because it happens without any previous infection sign and there are usually sequelae after the infection. Therefore, the patient generally

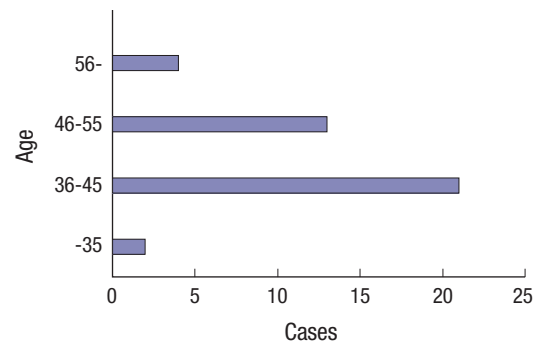


Fig. 5. Distribution of precedent cases according to the age of surgeons.

claims that the infection has resulted from malfeasance and files a malpractice lawsuit. With regard to nosocomial infection-related legal disputes in Korea, SSI is the most common reason for lawsuits and the department of plastic surgery is the third most common department for lawsuits after the departments of orthopedics and neurosurgery. There has been an increase in the number of plastic surgeries in Korea, and patients usually have high expectations of the results; therefore, they might be disappointed if SSI occurs (11).

In the present study, we found that the number of litigations associated with SSI showed an increasing trend; however, we cannot conclude that the increase in SSIs is associated with an increase in the number of procedures. The increase in SSI litigations might be related to better knowledge about SSI and high expectations for infection surveillance. Patients do not believe that SSI cannot be resolved; however, they consider that SSI should be prevented after surgery in health care centers.

Clean wound surgery with an uninfected wound, where no inflammation is encountered and where the respiratory, alimentary, genital, and urinary tracts are not involved, usually has a low risk of contamination with predictable SSI (12,13). The rates of SSI in clean/contaminated, contaminated, and dirty wound cases are lower for plastic surgery than for other surgeries. However, in clean wound cases, the rate of SSI is similar between plastic surgery and other surgeries (14). The infection rate of clean wounds is considered the lowest among all types of wounds; however, in the present study, all cases had clean wounds. This unusually high number of litigations for SSI associated with clean wounds might be explained by the high number (> 80%) of plastic surgeries with clean wounds and the fact that people usually accept the occurrence of SSI associated with dirty wounds but blame the surgeon for SSI associated with clean wounds. Therefore, thorough preoperative explanation about SSI is warranted in cases of clean wound surgery.

All patients in this study experienced complications, followed by SSI. Patients filed lawsuits because of not only the SSI itself, but also its complications, which might result in permanent sequelae. When rhinoplasty provides the patient with full aesthet-

ic satisfaction, even if breathing difficulties are present, there is a low chance of dispute (15). The precedent cases were not extracted only from the field of aesthetic surgery on purpose. They were based on an extensive analysis of the total cases in plastic surgery (reconstruction and aesthetic procedures) related to SSI in South Korea. Reconstruction litigation cases related to SSI were very rare. Nevertheless, we included litigation cases associated with not only aesthetic surgery, but also reconstructive surgery. Patient expectations of good aesthetic results are very high, especially in aesthetic plastic surgery, which is performed for personal reasons and not medical reasons. Irrespective of the improvements in surgical techniques, modern medicine has limits and aesthetic procedures also may cause complications, including SSI. The present study points out the lack of preoperative explanation about the possibility of SSI and recognizes malfeasance with respect to complications. It has been reported that information about the procedure, risks, hazards, alternatives, medications, and aftercare should be explained to the patient and understood by the patient so that the patient can take an informed decision (16).

Inadequate documentation has been reported to be another common issue related to malpractice claims, and it can compromise legal defence (17). Thorough documentation of events can help avoid losing a litigation (18), and this applies to plastic surgery. Without proper documentation, it is difficult to prove that proper preoperative explanation was provided. We should keep in mind that thorough documentation is as important as the surgery itself.

Plastic surgery involves a variety of surgical procedures. A recent literature review reported that the rate of SSI in plastic surgery varies greatly according to the type of surgery (19). In our study, we found that breast surgery was associated with the highest incidence of SSI. Recently, the number of breast surgeries has increased, and breast surgery is the second most common procedure associated with aesthetic surgery malpractice claims in Korea (20). Although blepharoplasty is the most frequent aesthetic procedure in Korea, it is difficult to find SSI litigation cases associated with blepharoplasty (21). We cannot assume that the incidence rate of SSI related to blepharoplasty is low; however, we can assume that the sequelae from SSI related to blepharoplasty occur at a low rate considering that patients usually file lawsuits after the occurrence of complications.

Breast plastic surgery can be regarded as 'clean surgery,' and the infection rate should theoretically be low (22); however, in reality, breast surgeries have been reported to have a high incidence of wound infection, ranging from 3% to 30% (23). Risk factors for infection associated with breast implants have not been adequately assessed in prospective studies with long-term follow-ups (24). Nonetheless, the surgical technique, use of acellular dermal matrix, and breast reconstruction with implants after mastectomy are believed to influence the risk of infection

(25). The origin of individual implant-associated infection is often difficult to determine. Rarely, breast implant infections have resulted from contaminated implants, or the use of contaminated saline or contaminated marking solution. Guidelines from multidisciplinary expert groups in the United States also recognize the low risk of SSI with breast augmentation or reconstruction surgery and do not recommend routine antimicrobial prophylaxis, except for patients who have particular risk factors for infection, such as diabetes mellitus, obesity, tobacco use, coexisting infections elsewhere, known colonization with microorganisms, and an immunocompromised state (23). Even in the precedent cases, the use of pre-operative antibiotic prophylaxis was not considered. Most patients and surgeons are unwilling to accept the loss of an implant and the discomfort, cost, and disability associated with implant removal, treatment, and implant replacement until they are convinced that all medical therapy attempts have failed. In some cases, such an approach might worsen the complications. Wound infection after breast surgery can have severe consequences, such as poor cosmesis, and in cases of breast cancer, it can delay subsequent adjuvant chemotherapy and radiation therapy. Patients generally do not accept the sequelae because SSI related to breast surgery usually results in breast parenchymal necrosis, breast loss, loss of nipple areolar, scar, and sensory change, which are quite noticeable.

In 2014, there were 40,320 procedures in body contouring surgery, which is the third most popular procedures, 9.2% of total aesthetic surgical procedures in Korea (26). In this study, body contouring surgery was the second most frequent type of procedure associated with SSI. The reason for the high number of SSI in body contouring surgery as follows: 1) high number of procedures; 2) need relatively long intravenous antibiotics period due to the large dissection area in abdominoplasty, but minimal admission period and outpatient base treatment in primary local clinics; 3) infection susceptible nature of adipose tissue; 4) obesity itself is often associated with impaired immune function, which may lead to increased susceptibility to infection with a number of different pathogens.

The most commonly encountered microorganisms associated with SSI in plastic surgery include *Staphylococcus aureus* and various streptococci (27). Colonization of the host by potentially pathogenic microorganisms is a prerequisite for the development of nosocomial infections. Although potentially pathogenic microorganisms can be transmitted to patients from the hands of health care workers and contaminated equipment, the patient's own flora is the primary source (28, 29). But in our study, we could not find any relationship between surgeon's liability and the type of isolated microorganisms. However, if the surgeon did not perform a microbiology test, the court considered SSI to be the surgeon's fault and ruled in favor of the patient. There were six such cases, and all occurred in primary local clinics. In one case, a microbiology test was performed; how-

ever, the result was not checked and empirical antibiotics were not administered at a secondary local hospital.

If there are limited facilities for a microbiology test in a primary local clinic, the surgeon should transfer the patient to a high-level institution or request a microbiology test from an outsourcing laboratory when SSI is suspected.

The usual winning rate of plaintiff in general medical litigation is 26.3% in Korea; however, in our study, the winning rate was high at 86%. Although SSI is not frequent in plastic surgery, it has a high rate of litigation and high winning rate of plaintiffs. The origin of individual surgery-associated infection is often difficult to determine. Therefore, there was no precedent case based on only the existence of SSI. It is almost impossible for the patient to prove that the SSI originated from the surgical procedure, followed by malfeasance. Therefore, patient management after SSI played a major role in the litigations, and the court recognized the surgeon's liability in many cases. Passive treatment policies in primary local clinics can lead to severe complications associated with SSI, and patients then file lawsuits. In cases of SSI after breast implant insertion, the court recognized that the surgeon is at fault if the implant is not removed immediately and if the patient is not treated conservatively and then transferred to a more equipped hospital. It is easy for the plaintiff to prove that the complications are the fault of the surgeon based on passive treatment in the postoperative period, and this is different from general medical litigation cases, in which it is very difficult to prove that the complications are the fault of the surgeon.

Even when the court recognizes malfeasance with regard to the management of SSI, the court considers that every procedure has a certain amount of risk for infection and considers the patient factors that might aggravate infection, such as smoking, old age, and diabetes. Therefore, the surgeon's liability is generally limited with regard to the outcome.

To our knowledge, this is the first study on medical litigation related to SSI in the field of plastic surgery. However, this study has several limitations. First, the precedents were classified as 'malpractice lawsuits,' which is a broad term, and there was no sub-classification. Therefore, we had to use a variety of search terms in order to include every precedent related to SSI in the field of plastic surgery. However, some precedents might have not been included in this study. Second, precedents are documents focused on the legal judgement between defendants and plaintiffs; therefore, there was not enough medical information in the documents. Hence, it was impossible to analyze the patient's intrinsic and extrinsic factors, which could have aggravated the SSI. Moreover, we could not access data on the detailed progress after the SSI. However, we believe that the present study includes sufficient information on medical litigation related to SSI and provides valuable lessons for not only plastic surgeons, but also the vast majority of surgeons from other fields.

Medical claims are generally initiated owing to negative outcomes; however, not all these claims result from medical negligence. The number of claims owing to SSI after plastic surgery is increasing. The handling of infection was one of the key factors that influenced the judgement, and preoperative explanation about the possibility of infection is important. When a SSI is suspected, the surgeon should perform immediate microbiology tests, administer appropriate antibiotics, and manage the wound aggressively. If necessary, the patient should be transferred to more advanced medical facilities or the department of infection should be consulted. Moreover, preoperative explanation about infection, complications, sequelae, and the possibility of revision; meticulous documentation; and good communication might decrease the number of litigations and indefensible malpractice claims. The findings of this study can help surgeons achieve high patient satisfaction and reduce liability concerns.

DISCLOSURE

The authors have no potential conflicts of interest to disclose.

AUTHOR CONTRIBUTION

Conception and coordination of the study: Hong SE. Design of ethical issues: Park BY, Kang SR, Hong SE. Acquisition and cleansing of data: Kwon JW, Hong SE. Data review: Kwon JW, Hong SE. Statistical analysis: Kwon JW. Manuscript preparation: Kwon JW, Hong SE. Manuscript approval: all authors.

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