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Clinical Study

Triclosan-coated sutures reduce wound infections after spinal surgery: a retrospective, nonrandomized, clinical study

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Abstract

BACKGROUND CONTEXT: Surgical site infection (SSI) is a serious postoperative complication. The incidence of SSIs is lower in clean orthopedic surgery than in other fields, but it is higher after spinal surgery, reaching 4.15% in high-risk patients. Several studies reported that triclosan-coated polyglactin 910 sutures (Vicryl Plus; Ethicon, Inc., Somerville, NJ, USA) significantly reduced the infection rate in the general surgical, neurosurgical, and thoracic surgical fields. However, there have been no studies on the effects of such coated sutures on the incidence of SSIs in orthopedics.

PURPOSE: To compare the incidence of wound infections after spinal surgery using triclosan-coated suture materials with that of noncoated ones.

STUDY DESIGN/SETTING: A retrospective, nonrandomized, and clinical study.

PATIENT SAMPLE: From May 2010 to April 2012, 405 patients underwent a spinal surgical procedure in the Department of Orthopedic Surgery of two university hospitals.

OUTCOME MEASURES: The primary outcome was the number of wound infections and dehiscences.

METHODS: Two hundred five patients had a conventional wound closure with polyglactin 910 suture (Vicryl) between May 2010 and April 2011 (Time Period 1 [TP1]), and 200 patients underwent wound closure with triclosan-coated polyglactin 910 suture (Vicryl Plus) between May 2011 and April 2012 (TP2). Statistical comparisons of wound infections, dehiscence, and risk factors for poor wound healing or infection were performed. None of the authors has any conflict of interest associated with this study.

RESULTS: There were two cases of wound dehiscence in TP1 and one in TP2 ($p=.509$). Using noncoated sutures in TP1, eight patients (3.90%) had wound infections, whereas one patient (0.50%) had wound infections in TP2 (using triclosan-coated sutures); the difference was significant ($p=.020$).

CONCLUSIONS: The use of triclosan-coated polyglactin 910 sutures instead of polyglactin 910 sutures may reduce the number of wound infections after spinal surgery.

Keywords: Surgical site infection; Spinal surgery; Triclosan; Antimicrobial suture; Wound closure

FDA device/drug status: Approved for this indication (Vicryl Plus).

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EVIDENCE & METHODS

Context
The authors aimed to assess whether a newer coating for suture decreases infections rates in spine surgery.

Contribution
The data suggest that this new suture coating may decrease infection rates.

Implications
Strong conclusions from these data are limited by the fact that the surgical numbers were small, infection rates were low, and the potential known and unknown confounders are numerous. While the findings are suggestive of benefit, an appropriately powered RCT is required in order to draw valid conclusions.

—The Editors

Introduction

Surgical site infection (SSI) is a serious postoperative complication. Above all, once infection occurs, catastrophic events can occur in the field of orthopedics, where implants are used and exposure to the bone marrow is common. The incidence of postoperative infections is lower in clean orthopedic surgery than in other fields, being reported to be about 0.6% to 1.8%; however, it is higher after prolonged spinal surgery, particularly spinal fusion, than after artificial joint replacement or osteosynthesis, and it reportedly increases to 4.15% in high-risk patients [1].

Many years ago, it was demonstrated that the presence of suture material in wounds increases the susceptibility of the tissue to infection. Various bacteria may contaminate not only the tissue in the surgical wound but also the suture material. To reduce bacterial adherence to surgical sutures, triclosan-coated polyglactin 910 suture materials with antiseptic activity (Vicryl Plus; Ethicon, Inc., Somerville, NJ, USA) were developed. Several studies showed a considerable decrease in bacterial adherence to triclosan-coated suture in vitro. Vicryl Plus has been used clinically in the United States and Europe since 2003, and its efficacy in preventing SSIs has been demonstrated by cohort studies and a randomized controlled trial in the general surgical, neurosurgical, and thoracic surgical fields [2–5]. However, there have been no studies about its effects on the incidence of SSIs in the field of orthopedics, particularly after spinal surgery, which is associated with a high incidence of postoperative infection.

The aim of this study was to compare the incidence of wound infections after spinal surgery using triclosan-coated suture materials with that of noncoated suture materials.

Patients and methods

Approval for this study design and the publication of this article were obtained from the University Hospitals and the University to which they belong in Kanagawa, Japan.

Data were collected retrospectively from 405 patients who underwent spinal surgical procedures in the Department of Orthopedic Surgery of University Hospitals, from May 2010 to April 2012. Patients who had already had an infection (debridement procedure or diagnosis of discitis) were excluded. Of these, 205 patients had a conventional wound closure with polyglactin 910 suture (Vicryl) between May 2010 and April 2011 (Time Period 1 [TP1]), and 200 patients underwent wound closure with triclosan-coated polyglactin 910 suture (Vicryl Plus) in the TP between May 2011 and April 2012 (TP2). The preoperative characteristics of the patients were comparable (Table 1). In all the patients, the preoperative surgical site was sprayed with chlorhexidine preparation and sterilized with povidone iodine. All patients received intravenous antibiotic prophylaxis 30 minutes before skin incision; the dose was repeated after 3 hours of surgery. Antibiotics were administered for 3 days, starting from the day of operation. Wound closure was achieved by interrupted suturing technique. ‘‘Size 1 Vicryl’’ or ‘‘Size 1 Vicryl Plus’’ was used for suturing the fascia and muscular layers, ‘‘3–0 Vicryl’’ or ‘‘Vicryl Plus’’ for subcutaneous tissue, and surgical staples for the skin. The needle used in both groups was a blunt-point needle (ETHIGUARD; Ethicon, Inc., Somerville, NJ, USA). The sutures were placed at intervals of about 1 cm. With regard to

Table 1
Demographic data of 405 patients undergoing spinal surgery

Parameter	TP1	TP2	p Value
Sex			.77
Male	131	125	
Female	74	75	
Age (y)	57.4	56.8	.78
BMI	23.0	24.0	.62
ASA class			.51
1	92	98	
2	93	88	
3	20	14	
4	0	0	
Wound status			.38
Clean	203	196	
Clean-contaminated	2	1	
Contaminated	0	2	
Dirty-infected	0	1	
Diabetes mellitus	36	36	.90
Atopic dermatitis	2	2	.68
Hemodialysis	1	1	.74
Malignant disease	10	9	.85
Immunosuppression	2	3	.49
Emergency procedure	12	14	.64
Smoking	49	41	.41
With implant	112	94	.12

TP, time period; BMI, body mass index; ASA, American Society of Anesthesiologists.