TITLE: Antibiotic-Impregnated Absorbable Collagen Sponges: Clinical Effectiveness

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RESEARCH QUESTIONS:

1. What is the clinical effectiveness of antibiotic-impregnated absorbable sponges for use in surgical patients for the prevention of infection?

2. What is the clinical effectiveness of antibiotic-impregnated absorbable sponges for the treatment of patients with diabetic foot ulcers?

METHODS:

A limited literature search was conducted on key health technology assessment resources, including PubMed, the Cochrane Library (Issue 3, 2009), University of York Centre for Reviews and Dissemination (CRD) databases, ECRI, EuroScan, international health technology agencies, and a focused Internet search. The search was limited to English language articles published between 2004 and December 2009. No filters were applied to limit the retrieval by study type. Internet links were provided, where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

RESULTS:

HTIS reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, controlled clinical trials, and observational studies.

Six randomized controlled trials and three observational studies were identified regarding the clinical effectiveness of antibiotic-impregnated absorbable sponges for use in surgical patients.
OVERALL SUMMARY OF FINDINGS:

Postoperative wound infection, is a potentially serious postoperative complication. Postoperative sternal wound infection is often caused by resistant staphylococci. In two studies, cardiac patients were randomized to receive routine intravenous antibiotic therapy alone (control group), or antibiotics and a gentamicin-collagen sponge (treatment group) in the sternotomy wound before surgical closure. Infection rates were greater in the control groups than the treatment groups (9.0% vs 4.3% and 5.9% vs 4.0%). The authors of one study concluded that routine use of these antibiotic-impregnated sponges in all adult cardiac surgery patients could be recommended while the earlier study suggested more evaluation may be needed. A long-term follow-up study of cardiac surgery patients was conducted to determine if the use of these sponges lead to microbial resistance or changes over time. The treatment group demonstrated a significant decrease in wound infection when compared to the control group and there was no observed change in the infection-causing organisms.

Gentamicin-collagen sponges were evaluated in two studies in patients with rectal cancer. Patients were randomized to receive an antibiotic-impregnated sponge or no sponge in the pelvic cavity after rectal cancer resection. The treatment group displayed fewer complications than the control group (20.7% vs 37.5%) and patients who received the sponge experienced significant survival benefits. A second study observed consecutive patients undergoing resection following radiotherapy. Rates of all observed infectious and perineal wound complications were lower in the treatment group than in the control group. The authors recommend the use of gentamicin-collagen sponges for this application.

Hidradenitis suppurativa skin lesions sometimes need to be excised surgically. One study randomized patients to wound closure with or without a gentamicin-collagen sponge to determine the effects of the antibiotic-impregnated sponge on post-surgical wound healing and infection. After one week patients who received the sponge experienced significantly fewer infections and other complications, but by the three month follow-up the complication rates were comparable. Wound healing was also comparable in both groups.

Before loop-ileostomy wound closure, patients were randomized to receive collagen sponges either with, or without, gentamicin in one study. There was no difference in wound infection rate between the two groups. From these results, the authors concluded that gentamicin-collagen sponges not be recommended for routine use in this procedure.

Postoperative infection of total hip arthroplasty is treated with debridement and application of four to six gentamicin-impregnated sponges. Investigators at a single centre evaluated the systemic gentamicin levels in their patients and determined that serum levels were toxic in
seven of 12 patients. Based on these results, the centre reduced the number of sponges and amount of gentamicin used in this procedure.8

Gentamicin-collagen sponges are effective for wound infection reduction in cardiac surgery patients, patients with rectal cancer undergoing tumor resection, and hidradentis supprativa.1-3,5-7 These antibiotic sponges are not recommended for use in patients undergoing loop-ileostomy closure4 and the use of excessive numbers of antibiotic-impregnated sponges may lead to toxic systemic levels of antibiotics.8
REFERENCES SUMMARIZED:

Health technology assessments
No literature identified

Systematic reviews and meta-analyses
No literature identified

Randomized controlled trials


Controlled clinical trials
No literature identified

Observational studies


APPENDIX – FURTHER INFORMATION:

Additional references

