

Abstract

Background:

In 2015 a new device for the collection of mediastinal fluid from patients with deep sternal wound infection (DSWI) in the presence of negative-pressure wound therapy (NPWT) became available. The present study was designed to evaluate whether changing sample collection devices increased micro-organism detection in patients undergoing NPWT.

Methods:

During 2013-2014, 207 samples were collected and cultured from NPWT patients (n = 23) to demonstrate the presence of DSWI using reticulated polyurethane sponge culture, a swab, and blood culture. In 2015, a new collection device was introduced for specimen collection. A total of 357 samples (n = 17) were collected using the ESwab™ (Copan, Murrieta, CA) for deep and superficial wound sample collection. In addition, blood culture devices were used for collecting mediastinal fluid aspirated directly from the wound and biologic fluid obtained from the NPWT device. Fisher exact test was performed to test the rate of independence rate of micro-organism identification using the NPWT sponge device and taking blood culture results as a reference for micro-organism identification.

Results:

After the introduction of the new collection device in our hospital, an overall increase in the detection of micro-organisms (46.7%) was reported. During 2013-2014 our traditional microbiologic collection method did not detect a pathogen in 30.4% of patients. During 2015, the new sample collection approach, direct from the NPWT device, improved micro-organism detection by 10.4% and reduced DSWIs with undetected pathogens to 17.6% ($p < 0.01$).

Conclusions:

As a result of proficiency gained in the last year, the most representative specimen in wound infection was represented by mediastinal fluid collected directly from the wound and the NPWT device. Given the correlation between the blood culture of micro-organisms detected using the ESwab device from the wound, mediastinal drainage, and drainage from the NPWT device, we can assume that the NPWT device may replace the other biologic sampling devices.