

Antibiotic Drug Release Clip

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Technology description

Background and Summary

This device is an antibiotic drug release clip. The advantage of this device over the current practice is that antibiotic is released post removal of suture drains so no drug will leak out through these conduits. The application of ultrasound is completely non-invasive (unlike injection), so it does not contribute to patient suffering. Not only will the application of ultrasound rupture the PLA membrane, releasing the drug into the wound site, sonication will also mobilize adherent bacteria making them more susceptible to antibiotics. This two-pronged attack makes ultrasound an ideal tool for drug-delivery to combat surgical site infection.

Detailed Description

The device is a clip which attaches to a 5.5 mm spinal fusion rod during the time of surgery. The clip contains a single reservoir filed with powdered antibiotic. Four drug delivery channels connect the reservoir to the surface and are sealed with a poly(lactic acid) membrane. The clip is manufactured in selective laser sintered (SLS) poly(ether ether ketone) and prototypes for initial evaluation are rapid prototyped in acrylonitrile butadiene styrene (ABS). The clip will be attached to the spinal fusion rod at the time of surgery. Approximately seven days post-implantation, ultrasound will be delivered to the wound site with a standard clinical probe. This will rupture the PLA membrane and release the antibiotic into the surgical site which will eliminate any bacteria before they develop into a full-blown infection.

Application area

- Antibiotic is released post removal of suture drains so no drug will leak out through these conduits
- Noninvasive; minimizing patient discomfort
- Two-pronged attack with sonication makes bacteria more susceptible to antibiotics

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