Non-invasive Zip wound-closure for lacerations in the adult and pediatric A&E

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Conclusion
The non-invasive Zip device demonstrated reduced treatment time, patient pain and anxiety and increased patient satisfaction in both the pediatric and adult emergency department.

The Zip can also eliminate a suture removal visit, which may save time and overall health care cost.

Aim
To assess if non-invasive Zip wound closure could be a way for A&E departments to save time and improve patient experience.

Introduction
Cutaneous lacerations requiring sutures remain a common reason for seeking medical care in the A&E department. Standard suturing can cause pain, anxiety and also necessitates time to ensure a good outcome. Non-invasive Zip wound closure, developed by ZipLine medical inc, has been an alternative to sutures and used in various settings but its role in a Swedish A&E department remains unknown.

Methods
13 adult and 13 pediatric patients who presented with minor lacerations to their respective A&E departments at the Karolinska University Hospital were randomized to nylon suture (Standard of care, SoC) or non-invasive Zip wound closure. Overall procedure time and patient pain (using Visual Analog Scale, 0-100 millimeters [mm]) were measured. Main outcome was total procedure time. Patient satisfaction, pain and adverse events were recorded via phone interview 10 and 30 days after treatment.

Results
The average total procedure time was 1120 seconds for Zip 4 device compared to 1934 seconds for SoC sutures. Average total treatment time in the child and adult cohorts was reduced 59% (p=0.004) and 62% (p=0.010) respectively in the Zip cases vs. traditional sutures. All patients reported 69% less pain during closure (mean VAS 12.8 and 40.9, respectively). 31% less pain during closure removal and 54% less pain when assessing overall scar pain (mean VAS 9.7 and 20.8, respectively) with the Zip device compared to sutures. Patients treated with the Zip device reported 66% less fear or anxiety during wound closure compared to patients treated with sutures (mean VAS 11.8 and 34.6, respectively).

Discussion
The timesaving benefits of using non-invasive Zip wound closure in the A&E departments may be more apparent when used on longer wounds. The main timesaving aspect was later was later since sutures were removed during a primary care visit 11 times out of 13, and the Zip device was removed at home by the patient or guardian in all cases.

Figure 2, 3: Wound in A&E department before and after wound closure with zip device.

Figure 4, 5: Total procedure time measured in seconds in pediatric and adult patients.

Figure 6. Non-invasive Zip wound closure with adjustable straps.

Potential conflicts of interest:
Study sponsored by, and designed in collaboration with ZipLine medical inc.