**POSTOPERATIVE PAIN MANAGEMENT FOR OPEN EMERGENCY LAPAROTOMY WITH
CONTINUOUS INFUSION BILATERAL RECTUS SHEATH CATHETERS**

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BACKGROUND: Pain after open abdominal surgery has been challenging and many pain management techniques have been suggested. Thoracic epidural has been the standard approach provides good perioperative pain control but can has potential contraindications or can be technical difficult to performed. Also has increased risk of adverse effects, such as reduced mobility, haemodynamic instability, PONV, ileus. Rectus Sheath Catheters (RSC) placed by surgeons have shown reasonable effectiveness but patients still required increased volumes of opioids (PCA morphine). Increased opioid consumption can cause sedation, itching, PONV, ileus that make the postoperative management after open laparotomy more difficult. Our hypothesis was that Bilateral Rectus Sheath Catheters (BRSC) placed under ultrasound guidance by Anaesthetist will improve effectiveness of pain management and will decreased the opioid consumption, decrease the rate of side effects, improve patient satisfaction and will help with early mobilisation.

TECHNIQUE: We evaluated the efficacy of the placement of bilateral Rectus Sheath Catheters (RSC) at the end of the procedure under ultrasound guidance in emergency open laparotomy or converted to open major abdominal surgery. We used two different needle – catheter sets, Rectus Sheath Catheters Pack (Pajunk) and E-Catheters (Pajunk). The approach was bilateral in plane lateral to medial, on the top end of midline incision, identification of the posterior border in the middle of rectus muscle. Followed by 15ml of Levobupivacaine 0.25% expansion of the posterior aspect of the sheath. Consequently placement of the catheters on the posterior border in the middle of rectus muscle and further confirmation of catheters position with additional 5ml Levobupivacaine 0.25% expansion, visualization of further space expansion. Patient had consequently either boluses every 4-6h 40ml Levobupivacaine 0.25% or Local infiltration infusion through electronic pump (with Levobupivacaine 0.15%) with Continuous Background infusion 5-10ml/h

METHODS: This study contains primary results from an ongoing quality improvement project that has clinical governance and ethical approval. For the collection of data the audit protocol has been used and completed with supervision of pain team. The project took place in Hinchingsbrooke Hospital, North West Anglia NHS Foundation Trust.

RESULTS:
The total number of patient undergone major abdominal operation with midline incision were 45, predominantly emergency laparotomies. The Graph 1 shows the pain in 40 of the 45 patients, because 5 of the patient remain intubated in ITU for the first 24h and have been excluded. The pain control was very good immediately postoperatively (0h) 38/40 (95%) and up to the 2h most of the patient had no pain33/40 (82.5%). In the 6h the majority 30/40 (75%) had no pain but 10/40(25%) had moderate pain (VAS 5- 6 /10) needed to use average amount of morphine PCA (mean 6ml/h at 6h). At this stage, most of the patients had administered bolus through RSC or pump has been attached, despite that 5 patients (50% of the patient with pain – 12.5% from the total number of patients) didn't had either up until 24h. As a result they have experienced moderate to severe pain (VAS 8/10) needed higher amounts of morphine. The effectiveness of the technique was more obvious after 12h [No pain 32/40 (80%)] in 24h [No pain 36/40 (90%)] and in 48h [No pain 38/40 (95%)]. The remaining patients in 12h 8/40 (20%) had moderate pain (VAS 5- 6 /10) needed higher amount of morphine PCA (mean 6 -8 ml/h) because 5 of those patients didn't had additional infiltration through RSC up until 24h.On 24h all the patients had some form of additional infiltration administered through RSC. PCA Morphine consumption over time (Graph 2) has been for most patient minimal just a few patient required higher amounts but still the use was average. No adverse reactions have been observed in this group of patient, including no PONV, no Itching, no sedation, no haemodynamic instability. All the patient had an early mobilisation on the 1st postoperative day 40/45 (88%) the patient that remained intubated in ITU 5/45 (12%) had delayed mobilisation, and they mobilized on day 2 (in true terms was the day1). From the methods of administration of local infiltration in 20/ 45 (45%)patient boluses of 40ml Levobupivacaine 0/25% have been administered by anaesthetist, and pump of local infiltration connected to RSC had 25/45 (55%) from which 4 out of 25 (16%) had a delayed start of the pump after 24h.

CONCLUSION:
The results show that Bilateral Rectus Sheath Catheters (BRSC) is a very effective alternative to thoracic epidural and probably the placement under ultrasound guidance is better than the placement by surgeons. Furthermore we have surprised with the minimal amount of PCA morphine required as we assumed that the majority of the pain would be of visceral origin. The amazing effectiveness in some of the patients made us think that actually the opposite and abdominal wall pain is prevalent. Regarding the patients that had experienced moderate to severe pain, the fact of the delay in administration of additional infiltration seems to be the main contributing factor. We have introduced a more standardised protocol with elastomeric pumps attached immediately postoperatively with better compliance.