**Analgesia for major abdominal surgery – the way forward.**

**Dr Anton Krige**

I will examine emerging approaches to acute pain management for major abdominal surgery, which for the purposes of this talk I will confine to major upper GI, lower GI, hepatobiliary and urological surgery (radical cystectomy) but excluding major gynaecological surgery (intermediate stress response for the most part) and major vascular surgery which has unique issues.

Such discussions are usually confined to the elective surgical population however non-elective surgery remains a large proportion of total surgical volume e.g. 20% of all major colorectal cancer present as non-elective cases [1].

The ERAS [2,3] approach is now accepted practice with the central paradigm of attenuation of the stress response, early nutrition and early mobilisation. Fluid management and acute pain management are pivotal to these processes with the latter two inextricably linked.

Importantly, as many elements of the ERAS protocol as possible should also be applied to our non-elective cases [4]. These patients suffer significantly worse outcomes (e.g. our recent elective colorectal mortality is 0.4% whereas our non-elective mortality is 13.5%, with mean length of stay is 7 days and 26 days respectively) but are disadvantaged by often receiving inferior acute pain management i.e. high dose systemic opiate.

For the purposes of discussion it is accepted that all patients receive standardised balance simple analgesia to include paracetamol and NSAIDS where not contraindicated. Increasingly gapapentinoids have been added to this regime. Alongside this a standardised balanced antiemesis strategy, including rescue antiemetics, is crucial to achieve the key trimodal elements above, as the prevalence and severity of prolonged PONV is usually underestimated in this cohort.

While acute pain management has evolved over the past 25 years for elective surgery application of the same advances have been slower for emergency surgery. There are many possible reasons for this including a greater presence of contraindications to neuraxial blocks e.g. sepsis and haemodynamic instability, less availability of the required skill set for more advanced techniques and the slow uptake of new techniques in medicine with initial implementation in the more controlled elective environment. Randomised trials of acute pain interventions are universally performed in elective surgery due to the perceived complexity of recruiting patients and assessing outcomes in non-elective surgery.

Over the past three decades we have advanced from intramuscular opiate as the sole approach until the advent of patient controlled intravenous analgesia along with the introduction of epidural analgesia in the early nineties. Epidural analgesia was limited to the highest risk patients with post-operative critical care provision until they became more widespread and managed at ward level in the NHS during this century. Early research at the turn of the century suggested improved outcomes from epidural analgesia and this drove the aforementioned implementation.

However the MASTERS trial [5] published in the Lancet in 2002, determined that there was no outcome difference between epidural analgesia and morphine PCA.

This led to a significant decline in the use of epidurals in Australasia and North America albeit not in the UK.

However at the same time laparoscopic surgery was taking off for many abdominal procedures and small portable high-resolution ultrasound machines were revolutionising anaesthetic procedures. The first modern descriptions of abdominal wall blocks began to be reported in 2001 [6] with McDonnel providing a more detailed description of the landmark approach to the posterolateral TAP block in 2004 [7] and further refined in 2007 [8]. In 2008 Peter Hebbard [9] published the first of several descriptions of ultrasound approaches starting with subcostal TAP blocks and later rectus sheath blocks.

Simultaneously we saw the development of long multi-holed catheters to delver local anaesthetic continuously into the preperitoneal space.

Many of us realised from the mid 2000’s that if spinal diamorphine mixed with bupivacaine could provide adequate analgesia for a caesarean section wound (essentially a low transverse incision) then it should suffice for any other operation utilising such an incision i.e. the majority of laparoscopic major abdominal surgery, radical prostatectomies and now many open major GI operations. Recent publications have corroborated this approach for laparoscopic colorectal surgery [10]. Along the way many hybrid combinations have developed.

I will attempt to present the current evidence and my common sense approach to targeting the array of available techniques appropriately.

1. Scott N, Smith J and Hill J: **National Bowel Cancer Audit Annual Report 2013** [http://www.hscic.gov.uk/catalogue/PUB11105/nati-clin-audi-supp-prog-bowe-canc-2013-rep1.pdf].
2. Gustafsson U, Scott M, Schwenk M, et al. Guidelines for Perioperative Care in Elective Colonic Surgery: Enhanced Recovery After Surgery (ERASÒ) Society Recommendations. World J Surg (2013) 37:259–284
3. Nygren J, Thacker J, Carli F et al. Guidelines for Perioperative Care in Elective Rectal/Pelvic Surgery: Enhanced Recovery After Surgery (ERASÒ) Society Recommendations. World J Surg (2013) 37:285–305
4. Khan S, Gatt M, Horgan A et al. Guidelines for implementation of enhanced recovery protocols. Association of Surgeons of Great Britain and Ireland. December 2009
5. Rigg JR, Jamrozik K, Myles PS, Silbert BS, Peyton PJ, Parsons RW, et al. Epidural anaesthesia and analgesia and outcome of major surgery: a randomised trial. Lancet 2002;359(9314):1276-82
6. Rafi AN. Abdominal field block: a new approach via the lumbar triangle. Anaesthesia 2001;56:1024–6.
7. McDonnell JG, O’Donnell BD, Tuite D, Farrell T, Power C. The Regional Abdominal Field Infiltration (RAFI) technique: computerised tomographic and anatomical identification of a novel approach to the transversus abdominis neuro-vascular fascial plane. *Anesthesiology* 2004; **101**:A899.
8. McDonnell JG, Laffey JG. The transversus abdominis plane block. *Anesthesia and Analgesia* 2007;**105**:282–3.
9. Hebbard P. Subcostal transversus abdominis plane block under ultrasound guidance. *Anesthesia and Analgesia* 2008; **106**:674–5.
10. Levy B, Scott M, Fawcett W, Fry C and Rockall T. Randomized clinical trial of epidural, spinal or patient-controlled analgesia for patients undergoing laparoscopic colorectal surgery. British Journal of Surgery 2011; 98: 1068–1078