roshan fernando, UCLH, London, UK

LEARNING OBJECTIVES

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• outline typical "fetal distress" CTG scenarios

what the anaesthetist needs to know re CTGs

communication issues on the delivery suite

classification of c section urgency

• outline anaesthesia options





CTG scenarios





CTG scenarios



where were you (the anaesthetist) when this happened

where were the theatre team

how was the urgency communicated to the team



where were the theatre team

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- primiparous spontaneous labour 40 weeks 6 cm dilated
- fetal bradycardia 70 beats/min for 5 minutes
- moved to operating theatre
- bradycardia resolved







multiparous - induced labour - 42 weeks - 4 cm dilated - oxytocin

- uterine hyperstimulation
- fetal bradycardia







- primiparous spont labour 38 weeks 6 cm dilated
- prolonged fetal bradycardia
- uterine contractions / low amplitude
- moved to operating theatre; cat 1 caesarean section
- uterine rupture found









multiparous - spont labour - 40 weeks - 3 cm dilated - oxytocin

- failure to progress in labour
- moved to theatre for a cat 2 caesarean section

midwives



obstetricians



team anaesthesia



communication



- regular rounds with obstetric team
- review of labour epidurals
- seniority of staff
- number of operating theatres available
- theatre staffing (elective + emergency)
- bleeps / phones / emergency calls

WHAT THE ANAESTHETIST NEEDS TO KNOW - "

- CTG interpretation ?
- fetal scalp (FBS): pH level cutoff (pH = 7.20)
- classification of emergency c section
- decision to delivery times (DDI)
- helping with ... in utero resuscitation
- anaesthesia technique Plan A & Plan B

WHAT IS AN EMERGENCY C SECTION

- Lucas classification category 1-4
 - 1: immediate threat to mother or fetus
 - 2: no immediate threat to both
 - 3: needs early delivery
 - 4: a time to suit mother & delivery staff



continuum of risk

Category	Definition
Normal	All four features are classified as reassuring
Suspicious	One feature classified as non-reassuring and the remaining features classified as reassuring
Pathological	Two or more features classified as non-reassuring or one or more classified as abnormal

Feature	Baseline (bpm)	Variability (bpm)	Decelerations	Accelerations
Reassuring	110–160	≥ 5	None	Present
Non-reassuring	100–109 161–180	< 5 for 40–90 min	Typical variable decelerations with over 50% of contractions, for over 90 min Single prolonged deceleration for up to 3 min	The absence of accelerations with otherwise normal trace is of uncertain significance
Abnormal	< 100 > 180 Sinusoidal pattern ≥ 10 min	< 5 for 90 min	Either atypical variable decelerations with over 50% of contractions or late decelerations, both for over 30 min Single prolonged deceleration for more than 3 min	

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I WANT TO DELIVER THE BABY NOW !!

- when is "now"?
- additional information to team
- category 1 alert? immediate mobilisation of staff
- waiting in theatre for you
- where is the theatre?

National cross sectional survey to determine whether the decision to delivery interval is critical in emergency caesarean section

Jane Thomas, Shantini Paranjothy, David James

2004



National cross sectional survey to determine whether the decision to delivery interval is critical in emergency caesarean section

retrospective study

18,000 singleton births by emerg CS

DDI:

0-15 min <u>vs.</u> 15-75 min <u>vs.</u> > 75min

Jane Thomas, Shantini Paranjothy, David James

2004
National cross sectional survey to determine whether the decision to delivery interval is critical in emergency caesarean section

Jane Thomas, Shantini Paranjothy, David James

- 30 min DDI for emerg c section international standard
- weak evidence
- short DDI can potentially cause harm to mother & baby
- 30 min DDI is not absolute for good fetal outcome
- DDI > 75 min assoc. with poorer outcomes (mother & baby)
- DDI measures quality of care / audit tool





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Timing of caesarean section according 2013 to urgency

Tak Yeung Leung, MD, Professor^{a,b,*}, Terence T. Lao, MD, Professor^a

• problems with most DDI studies

- mainly retrospective
- "real" cat 1 CS masked by "other" cat 1 CSs
- obstetrician bias (delivery of urgent cases will be quicker!)

BEST

Clinical

Obstetrics & Gynaecology

• CTG diagnosis of fetal distress (high sensitivity; poor specificity for fetal hypoxia)

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"the onset of fetal hypoxia does not start at the time of decision, but around the time of fetal bradycardia " Timing of caesarean section according to urgency

Tak Yeung Leung, MD, Professor^{a,b,*}, Terence T. Lao, MD, Professor^a



"the onset of fetal hypoxia does not start at the time of decision, but around the time of fetal bradycardia "

".. any relationship between the perinatal outcomes & duration of fetal hypoxia would be masked if the analysis was confined to DDI alone without consideration of the BDI - bradycardia to delivery interval "

OBSTETRICS GYNECOLOGY

DISTETRIC

Tak Yeung Leung, MRCOG, MD, Pui Wah Chung, MBChB, Michael Scott Rogers, FRCOG, MD, Daljit Singh Sahota, PhD, Terence Tzu-Hsi Lao, FRCOG, MD, and Tony Kwok Hung Chung, FRCOG, MD

Effect of the interval between onset of sustained fetal bradycardia and cesarean delivery on long-term neonatal neurologic prognosis

Emi Kamoshita ^a, Kan Amano ^a, Yuji Kanai ^a, Junko Mochizuki ^a, Yasuhiro Ikeda ^a, Shinzo Kikuchi ^a, '2010 Akihiro Tani ^a, Takashi Shoda ^a, Toshiyuki Okutomi ^b, Masahiko Nowatari ^c, Nobuya Unno ^{a,*}



OBSTETRICS GYNECOLOGY

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delivery on long-term neonatal neurologic prognosis

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GYNECOLOGY OBSTETRICS

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irreversible hypoxia (cord prolapse, uterine rupture, abruption)

- inverse correlation: UApH & BE vs. BDI
- arterial pH 0.011 per minute of BDI



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irreversible hypoxia (cord prolapse, uterine rupture, abruption)

- inverse correlation: UApH & BE vs. BDI
- arterial pH 0.011 per minute of BDI

irreversible or reversible hypoxia

no correlation: pH vs. DDI



in utero fetal resuscitation



in utero fetal resuscitation



syntocinon off

in utero fetal resuscitation



syntocinon off

position (left lateral)

in utero fetal resuscitation



syntocinon off

position (left lateral)

oxygen

in utero fetal resuscitation



syntocinon off

position (left lateral)

in utero fetal resuscitation



in utero fetal resuscitation





... into theatre

obstetrician



drugs

technique





midwife





technique



GA

rapid sequence induction, 50 yrs ago ...









CRICOID FORCE - SAFETY?



SUX

SUXAMETHONIUM FOR RSI

and the second s

SUXAMETHONIUM & DESATURATION TIMES

propofol induction + lidocaine + fentanyl

- Rocuronium 1mg/kg (R)
- Sux 1.5mg/kg (S)
- Sux only 1.5mg/kg (so)
 - (no lidocaine + fentanyl)

Rocuronium 400 sec to SpO2 <95%

? due to muscle fasiculation > ↑ O2 consumption

ROCURONIUM

• time to T1 - max depression

- roc 0.6mg/kg (licensed c section)
- < 60 sec, intubation time
- 60+ min, duration

(sugammadex available)

Magorian, Anesthesiology 1993

Q1

EPIDURAL TOPUP DILEMMAS

- labour room
- operating theatres
- safest drug available

- anaesthetist present with mother at all times
- vasoactive drugs available

• assistance (when things go wrong)

Risk factors for failure to extend labor epidural analgesia to epidural anesthesia for Cesarean section

S. ORBACH-ZINGER¹, L. FRIEDMAN¹, A. AVRAMOVICH¹, N. ILGIAEVA¹, R. ORVIETO², J. SULKES³ and L. A. EIDELMAN¹ Departments of ¹Anesthesiology, ²Gynecology and Obstetrics and ³Epidemiology, Rabin Medical Center/Beilinson Campus, and Sackler School for Medicine, Tel-Aviv University, Tel-Aviv, Israel

Conversion of epidural labour analgesia to anaesthesia for Caesarean section: a prospective study of the incidence and determinants of failure

S. H. Halpern^{1*}, A. Soliman¹, J. Yee¹, P. Angle¹ and A. Ioscovich²

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lee & sia

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A prospective audit of regional anaesthesia failure in 5080 Caesarean sections*

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A prospective at in 5080 Caesarea

S. M. Kinsella

2009

CSE < epidural block > 2 episodes breakthrough pain prolonged labour

lee & sia

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predictors	successful conversion	failed conversion	p value
maternal ht (cm)	163	167	0.02
analgesia duration (min)	600	400	0.054
clinician topups (<1)	86%	66%	0.016
multiple epidural attempts	6%	17%	0.086

logistic regression model

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471 predictors	successful conversion	failed conversion	30 p value
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logistic regression model
WHICH DRUG MIXTURE

lido bupiv levo ropiv chloroprocaine fentanyl sufentanil morphine diamorphine

alkalinisation

epinephrine neostigmine clonidine Mg

Extending epidural analgesia for emergency Caesarean section: a meta-analysis

S. G. Hillyard^{1,2*}, T. E. Bate², T. B. Corcoran^{1,3}, M. J. Paech^{3,4} and G. O'Sullivan²

- 11 RCT; 779 patients included
- labour epid in situ using low dose mix (fent + LA)
 - onset time
 - block supplementation

bupivacaine or levobupivacaine

lidocaine + epi ± fentanyl

ropivacaine 0.75% ± fentanyl





2011

BJA #









SPINAL / CSE



sitting position





hyperbaric bupivacaine 0.5%, 13mg

NDC 0641-6142-01 Phenylephrine HCI Injection, USP 10 mg/mL For Intravenous Use Dilute Before Use 1 mL Single Dose Vial DISCARD UNUSED PORTION PROTECT FROM LIGHT VVESST-VVARID UNUSED FORMULA Tor subcuraneous, intranuscular or Intravenous use Sampoules

diamorphine 400 mcg



phenylephrine @ 20-30 mcg/min

SPINAL / CSE



sitting position





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• fetal distress = time pressure

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communication, communication, communication

between teams

- fetal distress = time pressure
- communication, communication, communication

between teams

• basic CTG knowledge useful

- fetal distress = time pressure
- communication, communication, communication

between teams

- basic CTG knowledge useful
- have a strategy: GA or spinal (CSE) or epidural topup

- fetal distress = time pressure
- communication, communication, communication

between teams

- basic CTG knowledge useful
- have a strategy: GA or spinal (CSE) or epidural topup
- have a Plan B; ask for help!

<u>oaa-anaes.ac.uk</u>