

**Общая анестезия
операции
кесарево сечения:
пора адаптировать
стандартный подход**



Шифман Е. М. д. м. н. профессор

Показатели анестезиологической безопасности по МКБ десятого пересмотра:

- 1) осложнения анестезии во время беременности, родов, послеродового периода (O29,0–O29,9; O74,4–O74,9; O89,0–O89,9);
- 2) передозировка анестетиков (T41,0–T41,4);
- 3) другие осложнения анестезии (T88,2–T88,5);
- 4) неблагоприятный эффект анестетика, использованного в терапевтической дозе (Y45,0; Y47,1; Y48,0–Y48,4; Y55,1; Y65,3).



Общая анестезия показана в тех случаях, когда противопоказаны нейроаксиальные методы обезболивания





Доктор, пожалуйста
скажите мне
мальчик или девочка?

Я хочу обновить
статус в Facebook



Общая анестезия для КС:

Аспирация

Дыхательные пути

Индукция --- Опиоиды

Анестетики

Мышечные релаксанты

Общая анестезия для КС:

Преувеличивают ли анестезиологи
опасность?

M. Ajmal, European Journal of
Anaesthesiology, 2011



LONDON, UK

Euroanaesthesia 2016

The European Anaesthesiology Congress

28-30 MAY 2016

Частота показаний к оперативному родоразрешению и вид анестезии

	PA (n = 31)	OA (n = 30)	Всего
Не обнадеживающая ЧСС плода			
<i>Позднее замедление</i>	9 (29,0%)	8 (26,6%)	17 (27,8%)
<i>Брадикардия плода</i>	8 (25,8%)	9 (30,0%)	17 (27,8%)
<i>Тахикардия плода</i>	1 (3,2%)	2 (6,6%)	3 (4,9%)
<i>Variable deceleration</i>	1 (3,2%)	0	1 (1,6%)
Меконий	3 (9,6%)	2 (6,6%)	5 (8,19%)
Маточно-плацентарная недостаточность	3 (9,6%)	2 (6,6%)	5 (8,19%)
Предлежание плаценты	1 (3,2%)	0	1 (1,6%)
Отслойка плаценты	1 (3,2%)	0	1 (1,6%)
Олигогидроамнион	3 (9,6%)	1 (3,3%)	4 (6,5%)
Неправильное предлежание	0	2 (6,6%)	2 (3,2%)
Выпадение пуповины	1 (3,2%)	1 (3,3%)	2 (3,2%)
Преждевременный разрыв оболочек	0	1 (3,3%)	1 (1,6%)
HELLP-синдром	0	1 (3,3%)	1 (1,6%)
Аномалия плода	0	1 (3,3%)	1 (1,6%)

The effect of anaesthetic technique on neonatal morbidity in emergent caesarean section for fetal distress: A prospective observational study

Ipek Saadet Edipoglu*, Fatma Sevinç Çelik*, Gulin Haroglu Orcan**, Elif Cırakoglu Marangoz***

* Suleymaniyeh Birth And Women's Health Education And Research Hospital

** Mardin Birth And Women's Health Education And Research Hospital

*** Ergani Government Hospital

Background and Goal of Study: Emergent Caesarean section is an important area of challenge for an anaesthesiologist. The decision of the anaesthetic technique can be of paramount importance. In the literature there are few studies assessing the neonatal morbidity for fetal distress diagnosed emergent caesareans. The aim of our study is to evaluate the effect of anaesthetic technique on neonatal morbidity in emergent caesareans diagnosed for fetal distress.

Materials and Methods: Our article is a single centred prospective observational study which was approved by Bakirkoy Dr. Sadi Kocak Education and Research Hospital Clinical Studies Ethical Committee (Study protocol code: 2015/127). We enrolled pregnant patients who were diagnosed as fetal distress, aged 18-45 and BMI<40. When the patient was diagnosed for fetal distress and urgently moved to operating room, the senior anaesthesiologist decided the type of anaesthesia according to national guidelines and patients' approval. Then we divided the patients into two groups (group G and group R). All gravidas' hemodynamic data were recorded during surgery. We acquired neonatal data including APGAR scores in 1st, 3rd, 5th minutes, and umbilical blood gas (if indicated). After the operation we followed the neonates until discharge and recorded any morbid condition. We defined morbidity as 5-minute Apgar score (APGAR5) <7, any need for mechanical ventilation, any neonatal intensive care unit entrance and any respiratory insufficiency symptoms.

Results and Discussion: 61 patients were included in the study. We applied regional anaesthesia to 31 patients and 5 (19,2%) of neonates' had morbidity in general anaesthesia group (n=30) morbidity was detected for 9 (30%) cases. We did not detect any significant difference in terms of morbidity and length of hospital stay (p<0.05). We recorded a significantly diminished 1st minute APGAR scores (p=0.045) with general anaesthesia but we did not determine this reduction for 3rd and 5th minute APGAR scores (p>0.05). We found a significant reduction in heart rate in the 10th, 20th and 30th (p<0.032, p<0.001 and p=0.034 respectively) minutes in regional anaesthesia group. We reported a non-significant diminish for the cord pH values in the general anaesthesia group (p>0.05). But none of these findings effected our outcomes and we did not find any difference between regional and general anaesthesia in terms of neonatal morbidity. A Cochrane Database Review which included 29 included studies (1793 women) to evaluate the frequency of severe morbidity for caesarean section delivered neonates for non-reassuring fetal status. Similar to our findings they suggested that there is no evidence that regional or general anaesthesia is superior to one another in terms of outcomes. (1)

If there is enough time, regional anaesthesia is the reason of preference for elective caesarean sections and it may be reasonable to avoid general anaesthesia when possible because of numerous evidence reported in the literature (2) This fact appeared to be also true for our emergent fetal distress cases. Diminished APGAR1 scores and lower pH levels are concurrent with the literature for general anaesthesia cases and supports the use of regional anaesthesia. But as both techniques modalities are equivalent, if there is very limited time for management of anaesthesia or a coagulopathy exists in the mother, than general anaesthesia can safely administered to pregnant patients.

Conclusion: We could not find any data that regional anaesthesia is superior to general anaesthesia regarding neonatal morbidity and length of hospital stay for emergent caesarean section. We think that both techniques can safely be applicable for fetal distress diagnosed emergent caesareans in terms of neonatal morbidity.

Table incidence of operative indicators:	Anesthesia		Total
	Regional (n:31)	General (n:30)	
Non-reassuring Fetal Heart Rate			
Late deceleration	8 (25,8%)	8 (26,6%)	17 (27,8%)
Bradycardia	8 (25,8%)	9 (30,0%)	17 (27,8%)
Fast tachycardia	1 (3,2%)	2 (6,6%)	3 (4,9%)
Variable deceleration	1 (3,2%)	0	1 (1,6%)
Mekonium	3 (9,6%)	2 (6,6%)	5 (8,19%)
Umbilical insufficiency	3 (9,6%)	2 (6,6%)	5 (8,19%)
Placenta Previa	1 (3,2%)	0	1 (1,6%)
Abruptio placentae	1 (3,2%)	0	1 (1,6%)
Oligohydramnios	3 (9,6%)	1 (3,3%)	4 (6,5%)
Malpresentation	0	2 (6,6%)	2 (3,2%)
Umbilical Cord prolapse	1 (3,2%)	1 (3,3%)	2 (3,2%)
Premature Membrane Rupture	0	1 (3,3%)	1 (1,6%)
HELLP syndrome	0	1 (3,3%)	1 (1,6%)
Fetal Anomaly	0	1 (3,3%)	1 (1,6%)

References:

1. Afshari BB, Loni FE. Regional versus general anaesthesia for caesarean section. Cochrane Database of Systematic Reviews 2012, Issue 10. Art. No. CD004350.
2. Alpert CS, Bowen JR, Giles WB, Knoblich GE, Linn SJ, Roberts CL. Regional block versus general anaesthesia for caesarean section and neonatal outcomes: a population-based study BMC Medicine 2009, 7:20



Ipek S. Edipoglu
mail: ipek@ipek.org.tr



LONDON, UK

Euroanaesthesia 2016

The European Anaesthesiology Congress

28-30 MAY 2016

Выводы

- Не найдено подтверждения, что регионарная анестезия имеет преимущества перед общей анестезией по показателям заболеваемости новорожденного и продолжительности госпитализации после КС.
- Обе методики можно безопасно применять для экстренного КС при срочных родах и дистрессе плода

The effect of anaesthetic technique on neonatal morbidity in emergent caesarean section for fetal distress: A prospective observational study

Ipek Saadet Edipoglu*, Fatma Sevinç Çelik*, Gulin Haroglu Orcan**, Elif Cırakoglu Marangoz***

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Results and Discussion: 61 patients were included in the study. We applied regional anaesthesia to 31 patients and 5 (19.2%) of neonates had morbidity. In general anaesthesia group (n=30) morbidity was detected for 9 (30%) cases. We did not detect any significant difference in terms of morbidity and length of hospital stay (p>0.05). We recorded a significantly diminished 1st minute APGAR scores (p=0.045) with general anaesthesia but we did not determine this reduction for 3rd and 5th minute APGAR scores (p>0.05). We found a significant reduction in heart rate in the 10th, 20th and 30th (p<0.032, p<0.001 and p=0.034 respectively) minutes in regional anaesthesia group. We reported a non-significant diminish for the cord pH values in the general anaesthesia group (p>0.05). But none of these findings effected our outcomes and we did not find any difference between regional and general anaesthesia in terms of neonatal morbidity. A Cochrane Database Review which included 29 included studies (1793 women) to evaluate the frequency of severe morbidity for caesarean section delivered neonates for non-reassuring fetal status. Similar to our findings they suggested that there is no evidence that regional or general anaesthesia is superior to one another in terms of outcomes. (1)

If there is enough time, regional anaesthesia is the reason of preference for elective caesarean sections and it may be reasonable to avoid general anaesthesia when possible because of numerous evidence reported in the literature (2). This fact appeared to be also true for our emergent fetal distress cases. Diminished APGAR1 scores and lower pH levels are concerned with the literature for general anaesthesia cases and supports the use of regional anaesthesia. But as both techniques morbidities are equivalent, if there is very limited time for management of anaesthesia or a coagulopathy exists in the mother, then general anaesthesia can safely administered to pregnant patients.

Conclusion: We could not find any data that regional anaesthesia is superior to general anaesthesia regarding neonatal morbidity and length of hospital stay for emergent caesarean section. We think that both techniques can safely be applicable for fetal distress diagnosed emergent caesareans in terms of neonatal morbidity.

Table 1: Incidence of operative indicators			
	Regional Anaesthesia (n:31)	General Anaesthesia (n:30)	Total
Non-reassuring Fetal Heart Rate			
Low amniotic fluid	8 (26.0%)	8 (26.6%)	17 (27.8%)
Fetal bradycardia	8 (26.0%)	9 (30.0%)	17 (27.8%)
Fetal tachycardia	1 (3.2%)	2 (6.6%)	3 (4.9%)
Vaginal distention	1 (3.2%)	0	1 (1.6%)
Milestones	2 (6.4%)	2 (6.6%)	4 (6.5%)
Umbilical insufficiency	1 (3.2%)	2 (6.6%)	3 (4.8%)
Placenta Previa	1 (3.2%)	0	1 (1.6%)
Abruptio placentae	1 (3.2%)	0	1 (1.6%)
Oligohydramnios	2 (6.4%)	1 (3.2%)	4 (6.5%)
Malpresentation	0	2 (6.6%)	2 (3.2%)
Umbilical Cord prolapse	1 (3.2%)	1 (3.2%)	2 (3.2%)
Pre-eclampsia/Eclampsia/Ectopic	0	1 (3.2%)	1 (1.6%)
HELLP syndrome	0	1 (3.2%)	1 (1.6%)
Fetal Anomaly	0	1 (3.2%)	1 (1.6%)

References:

1. Afshari BB, Leiri FE. Regional versus general anaesthesia for caesarean section. Cochrane Database of Systematic Reviews 2012, Issue 10. Art No. CD004350.
2. Alpert CS, Bowen JR, Giles WB, Knobbeche GE, Linn SJ, Roberts CL. Regional block versus general anaesthesia for caesarean section and neonatal outcome: a population-based study BMC Medicine 2009, 7:20

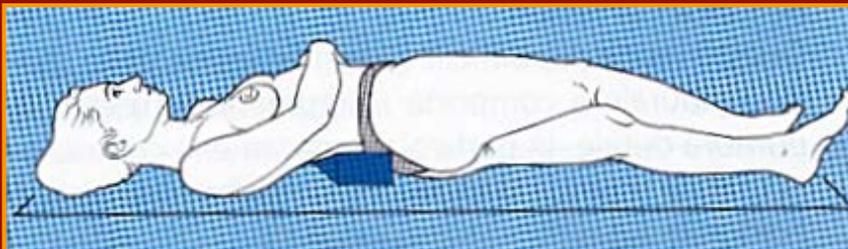


Ipek S. Edipoglu
mail: ikpek@ipek.com

Когда скорость является решающей?

- **Отслойка плаценты**
- **Выпадение петель пуповины**
- **Разрыв матки**
- **Сильное кровотечение при предлежании плаценты**
- **Кровотечение в родах**
- **Страдание внутриутробного плода при выраженных нарушениях по КТГ или рН крови плода из предлежащей головки $< 7,2$**

Аорто-кавальная компрессия. Профилактика



Клинообразная подушка
под область правого бедра



Смещение матки влево или
левое боковое положение



Скандинавские правила предоперационной подготовки

- Пациенты (как взрослые, так и дети) могут принимать чистую жидкость не менее, чем за 2 часа до общей или местной анестезии.
- Пациенту не следует принимать твёрдую пищу за 6 часов перед индукцией
- Кормление грудью следует прекратить за 4 часа перед введением в наркоз. То же самое касается молочных смесей
- Взрослые могут принять до 150 мл воды с пероральной премедикацией не менее, чем за 1 час до индукции, дети – до 75 мл
- Использование жевательной резинки или табака в любой форме следует отменить в течение последних 2 часов перед введением в наркоз
- **Эти правила также применимы для плановых операций кесарева сечения.**



Marc Van de Velde

- Сохранение сознания под наркозом регистрируется в общей практике, как один случай на 20 000 анестезий.
- При операции кесарево сечения в условиях общей анестезии, как один случай на 570 анестезий.



REVIEW



The use of remifentanyl during general anesthesia for caesarean section

Marc Van de Velde

Purpose of review

The purpose is to review the neonatal and maternal effects of remifentanyl given at induction of general anesthesia for caesarean section and prior to delivery of the baby.

Main findings

Remifentanyl seems to have short-lived respiratory depressant effects in approximately 50% of neonates, requiring short periods of mask ventilation or tactile stimulation of the neonate. Remifentanyl produces excellent maternal hemodynamic stability avoiding tachycardia and hypertension, possibly reducing the risk of maternal awareness.

Summary

Remifentanyl can be safely used at induction of general anesthesia provided healthcare workers are available to manage short-lived neonatal depression.

The National Audit Project 5 report has focused recently on the incidence of awareness during surgery performed under general anesthesia [6,7^{**}]. The overall incidence of awareness was 1/20000 anesthetics performed. Risk factors were opioid-free anesthesia, emergency/unplanned procedures, and procedures in which muscle relaxants were administered. Caesarean section is of course typically performed using such a technique. Not surprisingly, the incidence of awareness was highest in obstetric patients undergoing general anesthesia for caesarean delivery (1/570) [6,7^{**}].

For many decades now, the technique of general anesthesia for caesarean section is different from a conventional general anesthesia technique for nonobstetric procedures in nonpregnant patients. This is because of the physiological adaptations associated with pregnancy, fear of transplacental passage of anesthetic agents (and postnatal depression of the neonate) and a reduced maternal apnea to maternal desaturation interval. To induce general

Department of Cardiovascular Sciences, Department of Anesthesiology, UZ Leuven, KU Leuven, Leuven, Belgium

Correspondence to Marc Van de Velde, MD, PhD, EDIRA, Professor of Anesthesiology, Department of Cardiovascular Sciences, Section Anesthesiology, Catholic University Leuven, University Hospitals Leuven, Herestraat 49, B-3000 Leuven, Belgium. Tel: +0032 16 34 42 70; fax: +0032 16 34 42 45; e-mail: marc.vandevelde@uzleuven.be
Curr Opin Anesthesiol 2016, 29:005–009
DOI:10.1097/ACO.0000000000000294

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Marc Van de Velde. The use of remifentanyl during general anesthesia for caesarean section//
Curr Opin Anesthesiol 2016, Volume 29, P. 1-4.

Премедикации нет...



«пожалуйста,
расслабьтесь»

Шкала S. R. Mallampati

- I при осмотре видны занавески мягкого неба, язычок, передние и задние дужки миндалин,
- II видно то же, за исключением дужек миндалин, прикрытых языком,
- III видно только основание языка,
- IV язык соприкасается с твёрдым небом и язычок почти не виден

0,42%



I



II



III



IV

23,1%

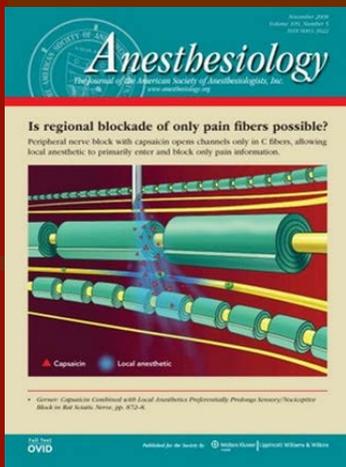
Изменения состояния дыхательных путей в родах

Классификация	Перед родами	После родов
1	9	4
2	35	27
3*	17	22
4*	0**	8

n=61 *P<0,001;

** Исключены из начального исследования;

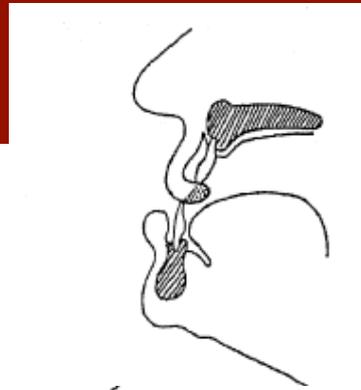
Kodali B. S. et al. *Anesthesiology* 2008; 108:357–362



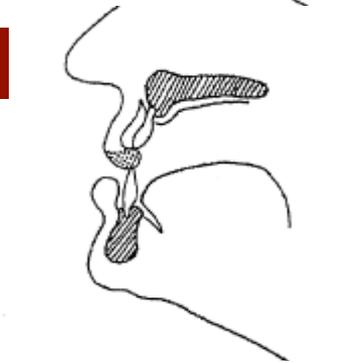
Прикус верхней губы

Khan Z.H. et al//Anesth. Analg., 2003. 96:595-9

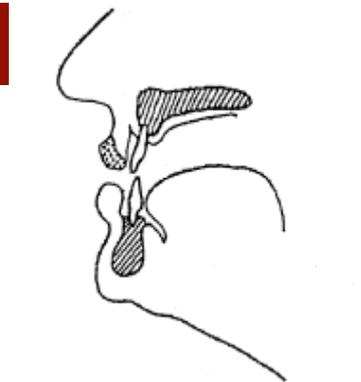
1. Выше красной каймы



2. На уровне красной каймы



3. Не может прикусить верхнюю губу





- Отношение окружности шеи к расстоянию от грудины до подбородка и набор веса за период беременности – новые предикторы трудной интубации трахеи у акушерских пациенток.
- Отношение окружности шеи к расстоянию от грудины до подбородка – новый предиктор трудной интубации у акушерских пациенток при превышении значения **7** и набор веса более чем на **11,75** кг во время беременности могут привести к техническим сложностям при интубации трахеи.

	Group E	Group D	p
BMI	28.3	32.7	0.001
Weight gain	9.4	11.8	<0.001
Neck circumference	34.7	37.6	0.071
SMD	14.3	12.7	0.027
Chest circumference	91	101	0.039
Ratio (CC/SMD)	6.4	8.08	<0.001

	Cut-off	Sensitivity (TP/P)	Specificity (FP/F)
Weight gain	11.75	68.4	16.4
Ratio (CC/SMD)	6.89	78.9	32.7

Преоксигенация в течение 3–5 минут
очень важна, поскольку:

Десатурация у беременной женщины развивается
быстрее, чем у небеременной;

Дыхательные пути сужены,
так как венозный застой способствует отеку слизистых;

Интубация трахеи сложнее
и может занять больше времени.



Беременность и сукцинилхолин...

Возможные побочные эффекты и осложнения, связанные с сукцинилхолином:

осложнения, связанные с деполяризацией: мышечные фасцикуляции, миалгии, повышение ВЧД, ВГД, ВЖД
продленная блокада (дефицит холинэстеразы)
дисритмии (бради- и тахиаритимии)
анафилаксия
миоглобинемия/миоглобинурия (может провоцировать ОПН)
гиперкалиемия
злокачественная гипертермия



Рокурония бромид и беременность



- Фармакокинетика рокурония бромида у беременных не отличается от таковой небеременных взрослых пациенток
- Минимальное прохождение через трансплацентарный барьер: коэффициент прохождения через плаценту = 0.16 (векуроний = 0.11)

Эсмерон. Монография по продукту 2003

Kelly M. C., et al Rocuronium: placental transfer and neonatal effects // Anesthesiology. 1996

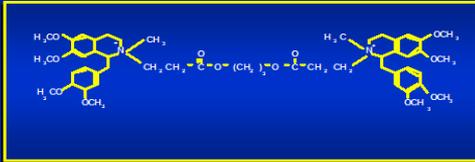
Feldman S. et al Drug interactions with neuromuscular blockers // Drug Safety – 1996

Fisher D. M. et al. Pharmacokinetics of rocuronium during the three stages of liver transplantation //

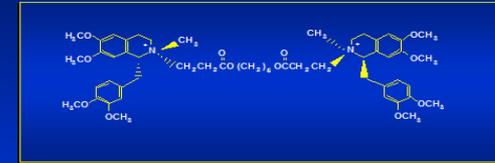
Anesthesiology. – 1997



Атракуриум



Цисатракуриум



Нимбекс

цисатракуриума бесилат

- Недеполяризующий мышечный релаксант
- МР средней продолжительности действия
- Один из 10 изомеров атракуриума (Тракриума)
- Органонезависимая элиминация (по типу Хофманна - спонтанная биodeградация)

Статистически достоверное **увеличение числа** случаев технических трудностей и неудач при интубации трахеи

21.00 – 8.00



Hawthorne L., Wilson R., Lyons G. Failed intubation revisited:
17-year experience in a teaching maternity unit.
Br J Anaesth 76:680–684, 1996.



- ПОЗВАТЬ НА ПОМОЩЬ
- вторичное оснащение для интубации, обычно используемые в вашей клинике
- экстраларингеальные устройства для дыхательных путей

Заключение авторов 2015 г.

- В настоящее время в рандомизированных клинических исследованиях отсутствует информация по клиническим исходам относительно применения давления перстневидного хряща при быстрой последовательной индукции в контексте эндотрахеальной интубации

Cochrane Database of Systematic Reviews

 PDF
 Info

Effectiveness and risks of cricoid pressure during rapid sequence induction for endotracheal intubation

Review Intervention

Catherine M Algie, Robert K Mahar, Hannah B Tan, Greer Wilson, Patrick D Mahar, Jason Wasiak 

First published: 18 November 2015
Assessed as up-to-date: 28 May 2015
Editorial Group: Cochrane Anaesthesia, Critical and Emergency Care Group
DOI: 10.1002/14651858.CD011656.pub2 [View/save citation](#)
Cited by: 0 articles [Check for new citations](#)

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Effectiveness and risks of cricoid pressure during rapid sequence induction for endotracheal intubation (Review)

Algie CM, Mahar RK, Tan HB, Wilson G, Mahar PD, Wasiak J



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Effectiveness and risks of cricoid pressure during rapid sequence induction for endotracheal intubation (Review)
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DOI: 10.1002/14651858.CD011656.pub2

700 пациентов
ИМТ 25
Натошак 4–6 часов

100%
успеха

Can J Anesth/J Can Anesth (2012) 59:648–654
DOI 10.1007/s12630-012-9718-4



REPORTS OF ORIGINAL INVESTIGATIONS

The LMA Supreme™ in 700 parturients undergoing Cesarean delivery: an observational study

Utilisation du LMA Supreme™ chez 700 parturientes accouchant par césarienne: une étude observationnelle

**Wei Yu Yao, MBBS · Shi Yang Li, MBBS ·
Ban Leong Sng, MBBS · Yvonne Lim, MBBS ·
Alex Tiong Heng Sia, MBBS**

Received: 29 August 2011 / Accepted: 13 April 2012 / Published online: 4 May 2012
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**Самые тяжелые осложнения
установки LMA –
это не использовать ее
на достаточно раннем этапе**

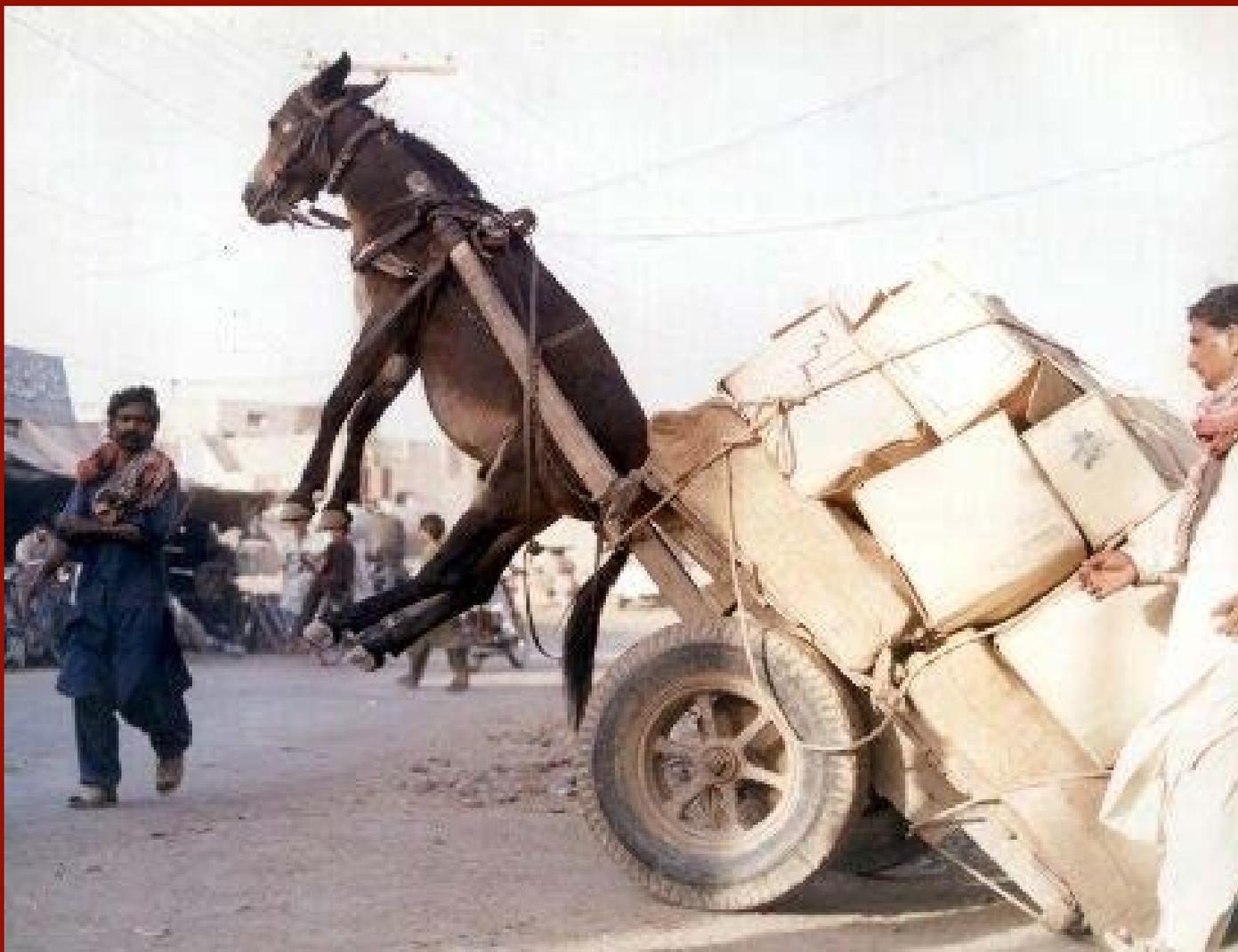
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- **Пустые амбиции**





**Если какая-нибудь неприятность
может случиться, она случается**

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