



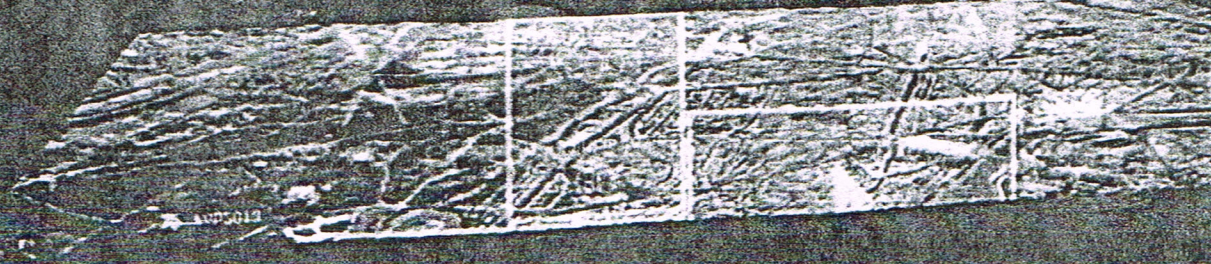
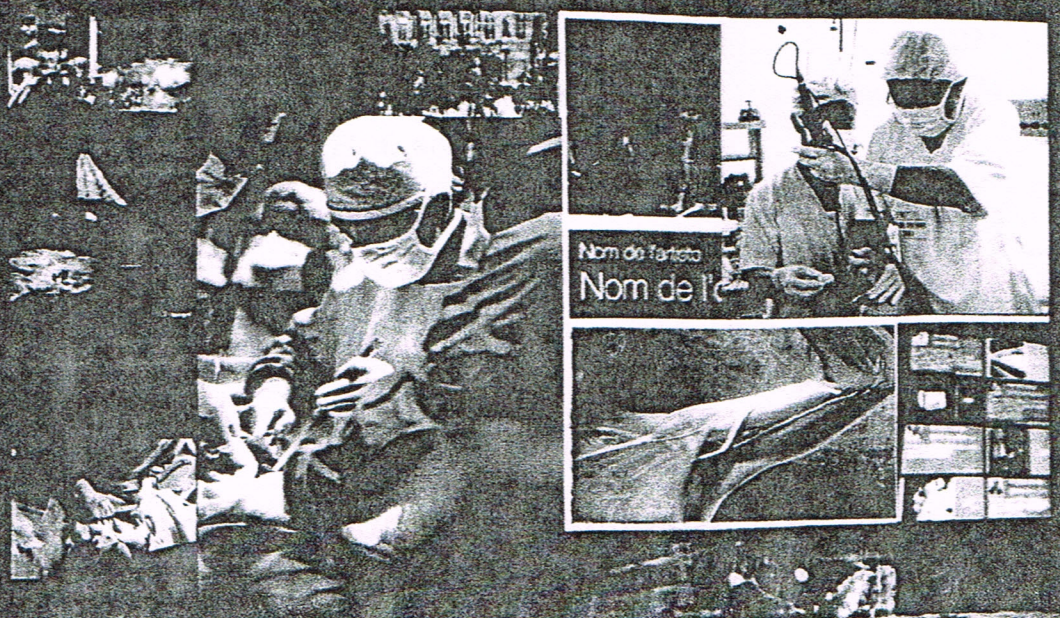
Recent Advances in Trauma Management

The 12nd WORKSHOP ON **TRAUMA UPDATE**
CONTINUING PROFESSIONAL DEVELOPMENT

May 13rd -14th, 2014

Gedung Pendidikan FK Unpad
Jl. Eyckman No.38 Bandung

2 DAYS



Introduction

- Until the early 1900s, PAI was managed conservatively.
- **World War I :**
patients who underwent mandatory operative exploration had a better chance of survival,
----> Laparotomy became the standard of care.
- **World War II :** early laparotomy improved survival.
- 1950s, laparotomy was the standard treatment of PAI pts
- 1960, Shafstam : **high rate of negative laparotomies**
----> Published a report on the **Non Operative Management** of abdominal injury
 - He had managed 125 of 180 PAI patients without surgery, with a mortality rate < 1 %

Slide 2

Up until the early 1900s, PAI was managed conservatively. During World War I, however, it was discovered that patients who underwent mandatory operative exploration with subsequent intervention had a better chance of survival, and this soon became the standard of care¹. In 1960, Shafstam, having noticed a high rate of negative laparotomies, published a report on the non-operative management of abdominal injury²; he had managed 125 of 180 consecutive patients with abdominal injury without surgery, with a mortality rate of less than 1 per cent.

Introduction

- Interest in **Selective Non Operative Management (SNOM)** of PAI began to increase.
- Managing patients without operation means :
 - potential postoperative complications,
 - costs and resource use
- SNOM for stab wounds is now common
- SNOM for gunshot wounds remains controversial

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Introduction

Recent guidelines have recommended :

- ☺ Observation for **haemodynamically stable** patients with **no evidence of peritonitis** for stab wounds and tangential GSW
- ☺ Up to 30 % of anterior abdominal GSW & 67 % of gunshot injuries to the back, **can be managed safely without operative intervention**

Zafar NS, Rushing A, Haut ER, Kisat MT, Villegas CV, Chi A et al, Outcome of selective non-operative management of penetrating abdominal injuries from the North American National Trauma Database, British Journal of Surgery 2011; 99 (Suppl 1): 155-165

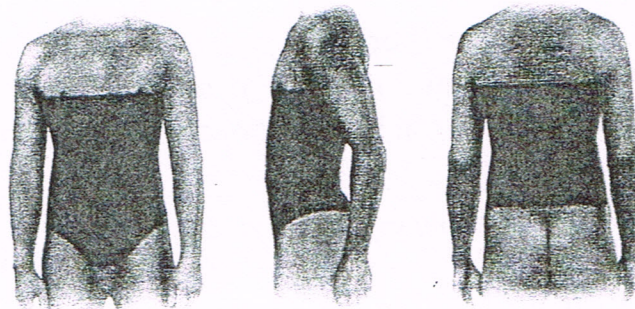
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Recent guidelines have recommended observation for haemodynamically stable patients with 2011 British Journal of Surgery Society Ltd *British Journal of Surgery* 2011; 99(Suppl 1): 155-165. Published by John Wiley & Sons Ltd 156 S. Nabeel Zafar, A. Rushing, E. R. Haut, M. T. Kisat, C. V. Villegas, A. Chi et al. evidence of peritonitis for stab wounds and tangential gunshot wounds^{12,13}. Studies have shown that up to 30 per cent of anterior abdominal gunshot wounds, as well as 67 per cent of gunshot injuries to the back, can be managed safely without operative intervention^{14,15}. However, many surgeons still prefer operative exploration of all abdominal gunshot wounds owing to concern of missing injuries that may increase morbidity and mortality. The current literature suggests a 10-20 per cent failure rate for SNOM of PAI^{3,16,17}. Even at high-volume centres, failed SNOM is associated with longer hospital stays and costs¹⁷. Although the associated morbidity of failed SNOM has been reported, the independent effect of failed SNOM and mortality has not been documented owing to the limited sample size of even the largest single-institution studies¹⁷.

OM)



Anterior abdomen

Flank

Back

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Mechanism of injury

- **Low velocity**
 - Knife wound/stab wounds
 - Disrupts only structures penetrated
- **Medium velocity**
 - Handguns and pellet guns
- **High velocity**
 - Military weapons and rifles

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Stab Wound vs Gunshot Wound

Gunshot Wound

The most commonly injured organs

1. Small bowel (50%)
2. Colon (40%)
3. Liver (30%)
4. Abdominal vascular structures (25%)

Slide 7- 8

Stab Wound

- Penetration of the abdominal wall by a sharp object.
 - More predictable pattern of organ injury.
 - Occult injuries can be overlooked resulting in devastating complications.
- The most commonly injured organs are :
 1. Liver (40%)
 2. Small bowel (30%)
 3. Diaphragm (20%)
 4. Colon (15%)

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Clinical Picture

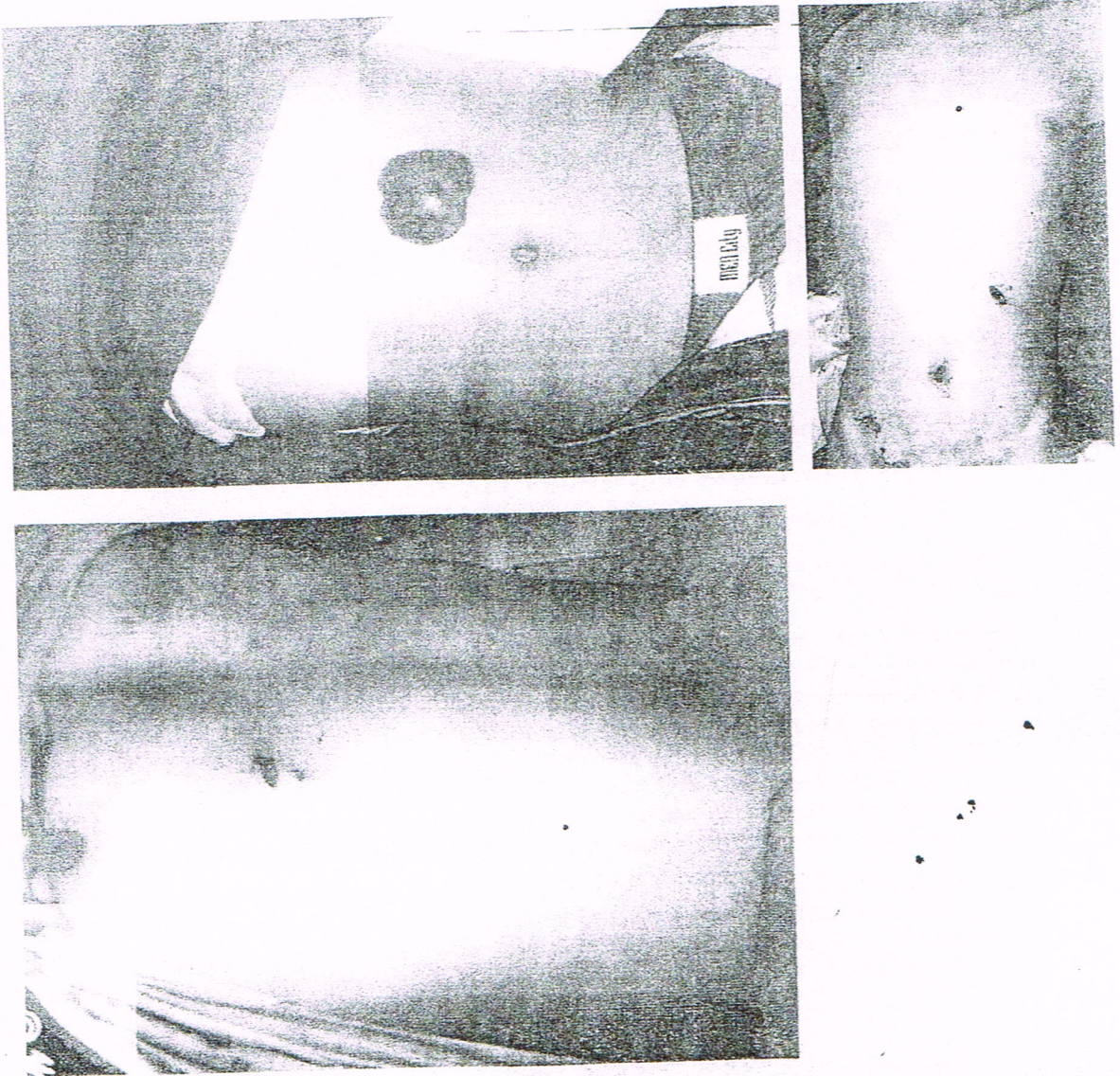
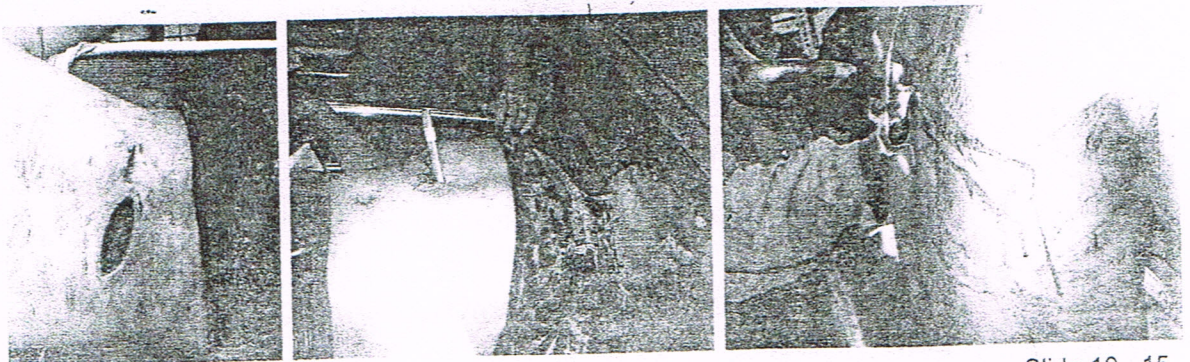


Foto Klinis



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Stab Wound

- Demetriades and Rabinowitz 1987 :
 - Prospective study of 651 patients with stab wounds to the anterior abdomen treated with **SNOM**
 - **Based mainly on serial physical examinations.**
 - Half cases were successfully managed without laparotomy.
 - Eleven (1.6%) patients who were initially observed, required a laparotomy later,
 - **No mortality** among them.
 - The accuracy of the initial physical examination was 93.9% (false negative initial exam 3.2%, false negative exam 2.9%).

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Demetriades and Rabinowitz³⁹ reported a prospective study of 651 patients with stab wounds to the anterior abdomen treated with a policy of selective nonoperative management based mainly on serial physical examinations. Half of these patients were successfully managed without a laparotomy. Only 11 (1.6%) patients who were initially observed, required a laparotomy later, and there was no mortality among them. The accuracy of the initial physical examination was 93.9% (false-negative initial exam 3.2%, false-negative exam 2.9%). In a similar study, Shorr et al.⁴⁰ found that only 32% of 330 patients with abdominal stab wounds had a therapeutic laparotomy and an additional 14% a nontherapeutic laparotomy. The remaining 53% were discharged without an operation.

Stab wounds to the back result in significant injuries requiring surgical repair in only about 15% of patients. In a South African prospective study of 230 stab wounds to the back the selection of treatment was based predominantly on physical examination; 85% of these patients were successfully managed nonoperatively. The diagnosis was delayed in five patients (2.2%) with no serious consequences.

- Shorr et al 1988 :
 - 330 patients with abdominal stab wounds :
 - 32% of had a therapeutic laparotomy
 - 14% a non therapeutic laparotomy.
 - 53% were discharged without an operation

Demetriades D, Velmahos GC, Indications for & Techniques of Laparotomy, in Feliciano DV, Mattox KL, Moore EE, Trauma, 6th ed, 2008

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- Indications for laparotomy such as :
 - peritoneal penetration,
 - omental evisceration,
 - free air on abdominal radiographs,
 - blood on abdominal paracentesis

are debated.

- 69% associated with significant intra-abdominal injuries, even in the absence of generalized abdominal tenderness
- Others have found no such association :
 - continue to use SNOM
 - avoid routine operation
- SNOM should be considered only in centers with experience & appropriate in-house staffing by trauma surgeons.

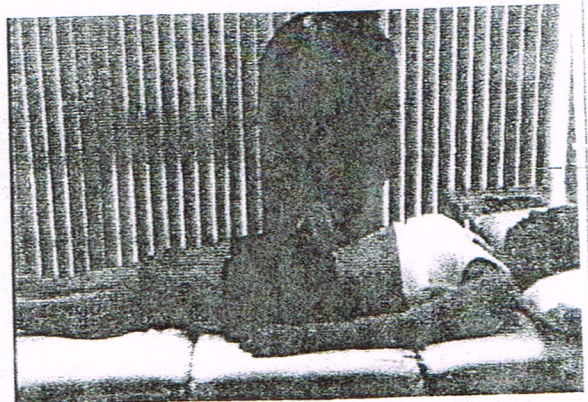
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Note :

Indications for laparotomy such as peritoneal penetration, omental evisceration (Fig. 30-3), free air on abdominal radiographs, or blood on abdominal paracentesis are debated. Some investigators report an association of 69% of such findings with significant intra-abdominal injuries, even in the absence of generalized abdominal tenderness.⁴² Others have found no such association and continue to use selective management and avoid routine operation in these patients.³⁹ Such policy should be considered only in centers with experience and appropriate in-house staffing by trauma surgeons. The role of diagnostic tests in the decision to operate on abdominal stab wounds is limited.

Stab Wound

- The role of diagnostic tests in the decision to operate on abdominal stab wounds is limited.
- A careful initial physical examination followed by serial examinations :
 - Are the most important tool to set the indications for laparotomy after abdominal stab wounds.



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Note :

The role of diagnostic tests in the decision to operate on abdominal stab wounds is limited. DPL has major limitations and very few centers use this modality for this type of trauma. Trauma ultrasonography is reported to have a specificity of 94% but a sensitivity of only 46%.⁴³ Helical CT may be of value but has not yet been formally studied in stab wounds as it has in gunshot wounds. Laparoscopy is inadequate to diagnose small bowel or retroperitoneal organ injury.⁴³ The "stabbogram" and local wound exploration are techniques rarely practiced in trauma centers. However, there are occasions in which additional tests are appropriate. For example, in patients with suspected liver injuries or hematuria or blood per rectum as their only symptoms, CT or rigid sigmoidoscopy should be strongly considered.^{44, 45}

In summary, a careful initial physical examination followed by serial examinations remain the most important tool to set the indications for laparotomy after abdominal stab wounds. Although symptom-directed additional tests may be useful in individual cases, in most patients the decision to operate or not should be based on serial physical exams and close hemodynamic monitoring.

• Stab Wound

- Symptom-directed additional tests may be useful in individual cases,
- In most patients :
Decision to operate or not should be based on
 1. serial physical exams and
 2. close hemodynamic monitoring.

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Gunshot Wound = GSW

- SNOM : standard of care for stab wound
- Abdominal GSW are treated by routine laparotomy in most trauma center

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Note :

Although selective management is considered as the standard of care for stab wounds, abdominal gunshot wounds are treated by routine laparotomy in most trauma centers. The mere presence of a gunshot wound to the abdomen with potential violation of the peritoneum equals a laparotomy. The main reasons cited for this approach are four: (1) There is a high incidence of intra-abdominal organ injury, which approaches 90%, (2) many centers have limited experience with gunshot wounds, (3) negative laparotomy is not particularly morbid, and (4) physical examination is unreliable. There is overwhelming evidence that the two latter statements are not true. Nontherapeutic laparotomy is associated with morbidity ranging from 12% to 40% and prolongation of hospital stay.⁴⁶ Physical examination is reliable for stab wounds and blunt trauma, even in the presence of mild and moderate intoxication,⁴⁹ so, some authors suggest, there is no reason to consider it unreliable for gunshot wounds.

GUNSHOT WOUNDS (GSWs)

- GSWs to the abdomen are still commonly treated with mandatory exploration because of multiple reports emphasizing a high incidence of intra-abdominal injuries
- And the complications of a missed injury or an injury delayed in recognition and treatment

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GSW

1. Demetriades D, Velmahos GC, Cornwell EE III 1997 :

- 1/3 GSW to anterior abdomen
- 2/3 GSW to the back
- > No significant intra abdominal injury ---> **safe to SNOM**

2. Velmahos GC, Demetriades D, Toutouzas KG 2001 :

- ☺ 1856 GSW pts : 1405 anterior / 451 posterior – 8 yr period
- ☺ **47% : no significant abdominal injury**
- 39% anterior / 74% posterior GSW**
- ☺ 80 pts (4%) developed signs ----> delayed laparotomy
- 5 pts (0.3%) : complications -----> managed successfully
- ☺ Nontherapeutic laparotomy : 9%

3. Based on these observations,

- ☺ there is a sizable portion of patients with abdominal GSW without significant intra-abdominal organ injury requiring surgical intervention.

☺ **Selected patients with :**

- isolated gunshot wounds to solid organs (liver, spleen, kidney)
- hemodynamically stable
- no peritoneal signs,
- > **may be managed nonoperatively**

4. In a study of 152 patients with gunshot injuries to the liver, 7% of all cases or 21% of cases with isolated liver injury were successfully managed non operatively

Demetriades D, Velmahos GC, Indications for & Techniques of Laparotomy, in Feliciano DV, Mattox KL, Moore EE, Trauma, 6th ed, 2008

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CURRENT MANAGEMENT OF PENETRATING ABDOMINAL INJURY (PAI)

Review of published literature

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CLASSIFICATION OF THE RESULT OF LAPAROTOMY

- **POSITIVE:**

- Needs definitive procedure
- Conservative management would have been inappropriate

- **UNNECESSARY**

- Minor procedure that could safely have been managed conservatively
- Or treated by wound exploration under local anesthesia

(e.g oversewing of a superficial laceration in the SB)

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NEGATIVE LAPAROTOMY

No intraperitoneal abnormality was identified

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Conditions for SNOM of PAI

How about practicing SNOM in trauma centers with a:

1. Low volume of penetrating trauma
2. Inadequate resources to provide 24-hour in-house coverage.
3. The inability to do serial physical examinations by physicians with reasonable experience

-----> prohibits the practice of SNOM

- It may be safer for small trauma centers with limited exposure to GSW victims to retain a policy of routine laparotomy.

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The remaining issue has to do with practicing selective management in trauma centers with a low volume of penetrating trauma or inadequate resources to provide 24-hour in-house coverage. The inability to do serial physical examinations by physicians with reasonable experience in this type of injuries prohibits the practice of selective management. It may be safer for small trauma centers with limited exposure to gunshot wound victims to retain a policy of routine laparotomy. The remaining centers should use for gunshot wounds the same indications of laparotomy that are established for stab wounds.

Conditions for SNOM of PAI

SNOM of PAI is recommended in:

1. Facilities with the resources and experience to select and monitor patients with PAI carefully
2. Capability to provide immediate surgical intervention to those who need it.

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The impact of published recommendations on the management of penetrating abdominal injury

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Correspondence to: Mr A. J. McKay (e-mail: amckay@doctors.org.uk)

Background: In patients with penetrating abdominal injury (PAI), haemodynamic instability and peritonitis are indications for laparotomy, but it remains uncertain whether laparotomy is indicated for evisceration, retained foreign body and pneumoperitoneum. In 1989, a review of 107 patients with PAI revealed a 78.5 per cent laparotomy rate, with 35 per cent considered unnecessary. The aim of this study was to review current practice in the same hospitals.

Methods: A retrospective review included case notes from 224 patients with PAI presenting to three hospitals between 2001 and 2005.

Conclusion: The laparotomy rate fell from 78.5 to 21.4 per cent over 25 years. The rate of unnecessary or negative laparotomy did not change. Isolated evisceration and retained foreign body remain relative indications.

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Practice Management Guidelines for Selective Nonoperative Management of Penetrating Abdominal Trauma

John J. Como, MD, Faran Bokhari, MD, William C. Chiu, MD, Therese M. Duane, MD,
Michele R. Holevar, MD, Margaret A. Tandoh, MD, Rao R. Ivatury, MD, and Thomas M. Scalea, MD

Background: Although there is no debate that patients with peritonitis or hemodynamic instability should undergo urgent laparotomy after penetrating injury to the abdomen, it is also clear that certain stable patients without peritonitis may be managed without operation. The practice of deciding which patients may not need surgery after penetrating abdominal wounds has been termed selective management. This practice has been readily accepted during the past few decades with regard to abdominal stab wounds; however, controversy persists regarding gunshot wounds. Because of this, the Eastern Association for the Surgery of Trauma Practice Management Guidelines Committee set out to develop guidelines to analyze which patients may be managed safely without laparotomy after penetrating abdominal trauma. A secondary goal of this committee was to find which diagnostic adjuncts are useful in the determination of the need for surgical exploration.

Como J.J et al *J Trauma*, 2010, 68:721-733

Conclusions: Although the rate of nontherapeutic laparotomies after penetrating wounds to the abdomen should be minimized, this should never be at the expense of a delay in the diagnosis and treatment of injury. With this in mind, a routine laparotomy is not indicated in hemodynamically stable patients with abdominal stab wounds without signs of peritonitis or diffuse abdominal tenderness. Likewise, it is also not routinely indicated in stable patients with abdominal gunshot wounds if the wounds are tangential and there are no peritoneal signs. Abdominopelvic computed tomography should be considered in patients selected for initial nonoperative management to facilitate initial management decisions. The majority of patients with penetrating abdominal trauma managed nonoperatively may be discharged after 24 hours of observation in the presence of a reliable abdominal examination and minimal to no abdominal tenderness. Diagnostic laparoscopy may be considered as a tool to evaluate diaphragmatic lacerations and peritoneal penetration in an effort to avoid unnecessary laparotomy.

Como J.J et al *J Trauma*, 2010, 68:721-733

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SNOM : Success & Failure

- Success rate is 75–80 % and improved over the time interval
- Failure rate 10–20 %
- Failed SNOM is associated with :
 - longer hospital stays & costs
- Failed SNOM = mortality has not been documented

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Non Therapeutic Laparotomy

- 1.7% - 38% : depends on experience & policies of the trauma center
- Morbidity : 3% - 19,7%
 - Respiratory complications : atelectases , pneumonia
 - Prolonged paralytic ileus
 - Surgical wound infection
 - Small bowel obstruction
 - Incisional hernia

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RECOMMENDATIONS

- a. Pts who are hemodynamically unstable or who have diffuse abdominal tenderness should be taken emergently for laparotomy (level 1)
- b. Pts who are hemodynamically stable with an unreliable clinical examination (i.e. brain injury, spinal cord injury, intoxication, or need for sedation or anesthesia). Should have further diagnostic investigation performed for intra peritoneal injury or undergo exploratory laparotomy (level1)
- c. A routine laparotomy is not indicated in hemodynamically stable pts with abdominal SWs **without** signs of peritonitis or diffuse abdominal tenderness (away from the wounding site) in centers with expertise (level2).

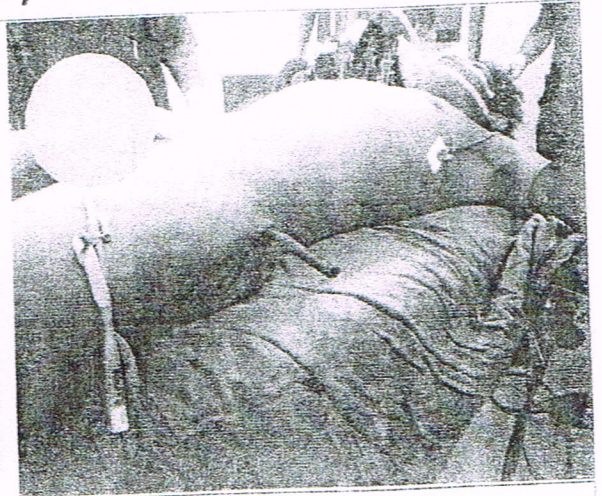
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RECOMMENDATIONS

- d. A routine laparotomy is not indicated in hemodynamically stable pts with abdominal GSWs if the **wounds are tangential** and there are no peritoneal signs (level2)
- e. Serial physical examination is reliable in detecting significant injuries after penetrating trauma to the abdomen, if performed by experienced clinicians and preferable by the same team (level 2)
- f. In pts selected for initial NOM, abdomino pelvic CT should be strongly considered as a diagnostic tool to facilitate initial management decision (level2)
- g. Pts with penetrating injury isolated to the right upper quadrant of the abdomen may be managed without laparotomy in the presence of stable vital signs, reliable examination, and minimal to no abdominal tenderness (level 3)
- h. The majority of pts with penetrating abdominal trauma managed non operatively may be discharged after 24 hours of observation in the presence of a reliable abdominal examination and minimal to no abdominal tenderness (level 3)
- i. Diagnostic laparoscopic may be considered as a tool to evaluate diaphragmatic lacerations and peritoneal penetration (level 2)

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S, male, 23 yrs, Febr. 3rd, 2012
 " Stabbed " by Iron rod.



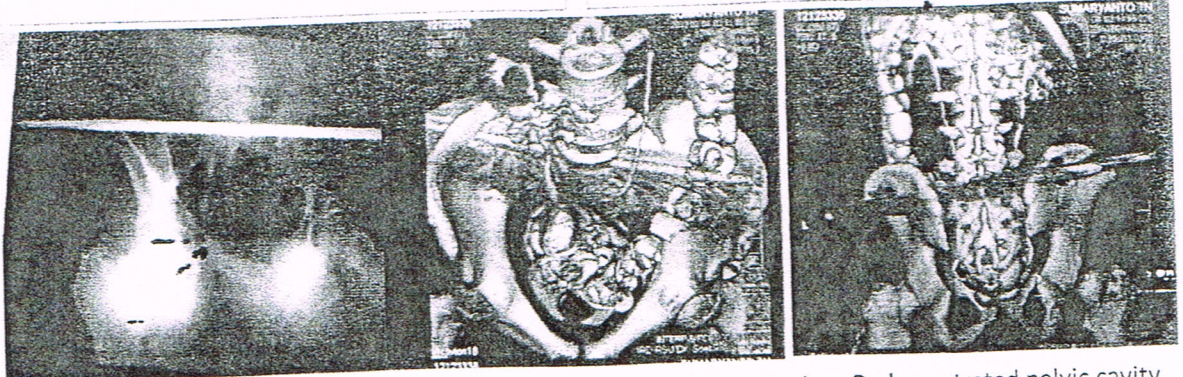
S, male, 23yrs, Febr. 3rd, 2012
 " Stabbed " by Iron rod.

09.10	10.00 pm	
• A : clear	clear	
• B : RR	20	20/min
• C : PR	76	80 beat/min
BP	110/70	110/80 mmHg

Assessment

- Stab wound on the flank
- Stable Hemodynamic

CT SCAN ABDOMEN



CT Assessment : Iron Rod penetrated pelvic cavity

Laparotomy
 Rod extrication
 Negative Laparotomy

Conclusion

- A part of anterior stab wound and GSW victims can be managed non operatively safely
- The mainstay of SNOM are :
 1. Close continuous monitoring
 2. Immediate operation with the 1st signs of peritonitis

TRAUMA ABDOMEN PENETRANS

LUKA TUSUK DAN TEMBAK

Anterior, Flank and Back

DR. Dr. M. Alsen Arlan Sp.B.KBD., MARS

Departemen Bedah FK Unsri / RSUP dr Moh Hoesin Palembang

TRAUMA PENETRANS ABDOMEN

☉ Ada 2 jenis trauma penetrans abdomen

1. Luka tusuk
2. Luka tembak

☉ Lokasi luka penetrans

1. Anterior
2. Posterior
3. Lateral

Selama lebih dari 30 tahun ini, para ahli trauma berpendapat bahwa indikasi laparotomi untuk luka tusuk abdomen dapat dilakukan secara selektif, indikasi terutama berdasarkan pemeriksaan klinik. Laparotomi negatif atau non terapeutik akan menimbulkan morbiditas yang cukup berarti. Shaftan 1960 dan Nance dkk 1969 adalah para ahli bedah pertama yang menganjurkan untuk tidak melakukan laparotomi rutin untuk semua luka tusuk abdomen. Demetriades dan Rabinowitz pada tahun 1987 mempublikasikan hasil penelitian prospektif 651 pasien dengan luka tusuk mengenai bagian anterior abdomen yang diobati selektif secara non operatif, indikasinya sebagian besar atas dasar pemeriksaan fisik. Setengahnya dari pasien tersebut berhasil sembuh tanpa laparotomi, hanya 11 pasien (1,6%) yang pada awalnya di observasi saja, kemudian harus menjalani laparotomi tanpa ada mortalitas.

Akurasi hasil pemertiksaan awal 93,9% (false negative pemeriksaan awal 3,2%, dengan false negative sebenarnya 2,9%).

Pada penelitian serupa yang dilakukan Shore dkk 1988, menemukan hanya 32% dan 330 pasien luka tusuk abdomen yang memerlukan laparotomi terapeutik dengan tambahan 14% laparotomi non terapeutik, sisanya sebanyak 53% sembuh tanpa operasi.

Bagaimana bila luka tusuk mengenai daerah posterior atau punggung? Untuk kasus sejenis ini malahan laparotomi terapeutik lebih sedikit lagi, yaitu hanya 15% dari seluruh pasien luka tusuk daerah punggung pada suatu penelitian. Laparotomi rutin untuk luka penetrans abdomen pada mulanya dipopulerkan dinegara-negara dengan kekerasan fisik banyak terdapat sehari-hari seperti di Amerika Utara dan Afrika Selatan, selain dengan senjata tajam juga dengan senjata api. Sejak tahun 1980 banyak penelitian mengenai efektivitas laparotomi selektif oleh ahli bedah di Eropah dan Inggris yaitu negara-negara dimana kekerasan mempergunakan senjata api relatif lebih sedikit, dan cara laparotomi selektif ini dianggap sebagai cara terbaik. Suatu penelitian prospektif meliputi 230 kasus luka tusuk yang mengenai punggung di Afrika Selatan, indikasi laparotomi terutama hanya berdasar pemeriksaan fisik saja.

Ternyata 85% kasus dapat dirawat tanpa operasi, 5 kasus (2,2%) baru dioperasi setelah observasi (delayed laparotomy) tanpa ditemukan komplikasi yang berarti. Akurasi pemeriksaan fisik disini 95,2% dengan false positive 7,6%, dan false negative 2,2%.

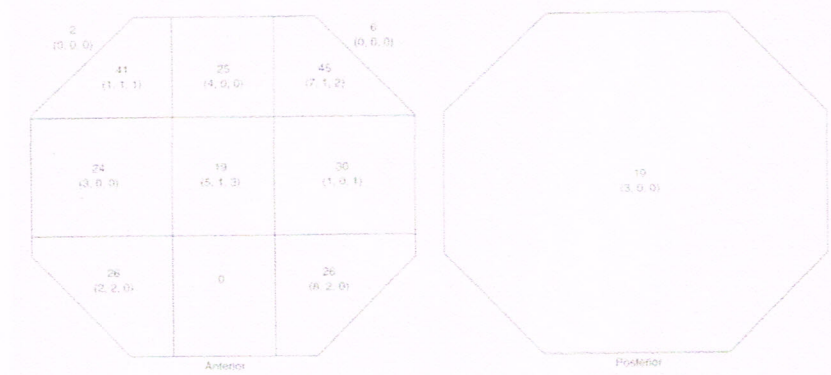
Suatu laporan dari Finlandia pada tahun 1995 oleh Lippaneim, Salo dan Haapioinm, menemukan 37% laparotomi negatif sewaktu masih menganut laparotomi rutin (mandatory laparotomy) untuk semua luka tusuk trunkal. McIntyre dkk 1989 melakukan penelitian retrospektif terhadap terhadap 107 pasien di Glasgow antara Januari 1980-Desember 1985, menemukan bahwa:

- 78,5% pasien luka tusuk menjalani laparotomi
- 35% diantaranya ternyata tidak perlu laparotomi atau laparotomi negatif
- Komplikasi akibat laparotomi negatif mencapai 24%

Maka sejak itu, peneliti menganjurkan agar dilakukan tindakan yang lebih konservatif terhadap luka tusuk trunkal. Laparotomi hanya dilakukan berdasar indikasi saja dan ini dianggap sebagai “the best practice” sejak waktu itu.

Apakah criteria eksklusi dari sudut anatomi untuk pasien dengan trauma penetrans trunkal, yaitu abdomen anterior dan posterior?

- Perlukaan daerah toraks yang tidak menembus kedalam rongga abdomen
- Perlukaan dibawah ligamentum inguinale kanan dan kiri untuk sebelah depan
- Dibatasi oleh crista iliaca kanan dan kiri untuk sebelah posterior



Clarke SCE, Stearns AT, Payne C, McKay AJ. BrJ Surg 2008, 95: 515-521

Apakah indikasi untuk laparotomi pada trauma penetrans abdomen?

1. Hemodinamik yang tidak stabil, SBP < 90 mmHg
2. Peritonitis dengan tanda-tanda rangsangan peritoneal diluar daerah perlukaan

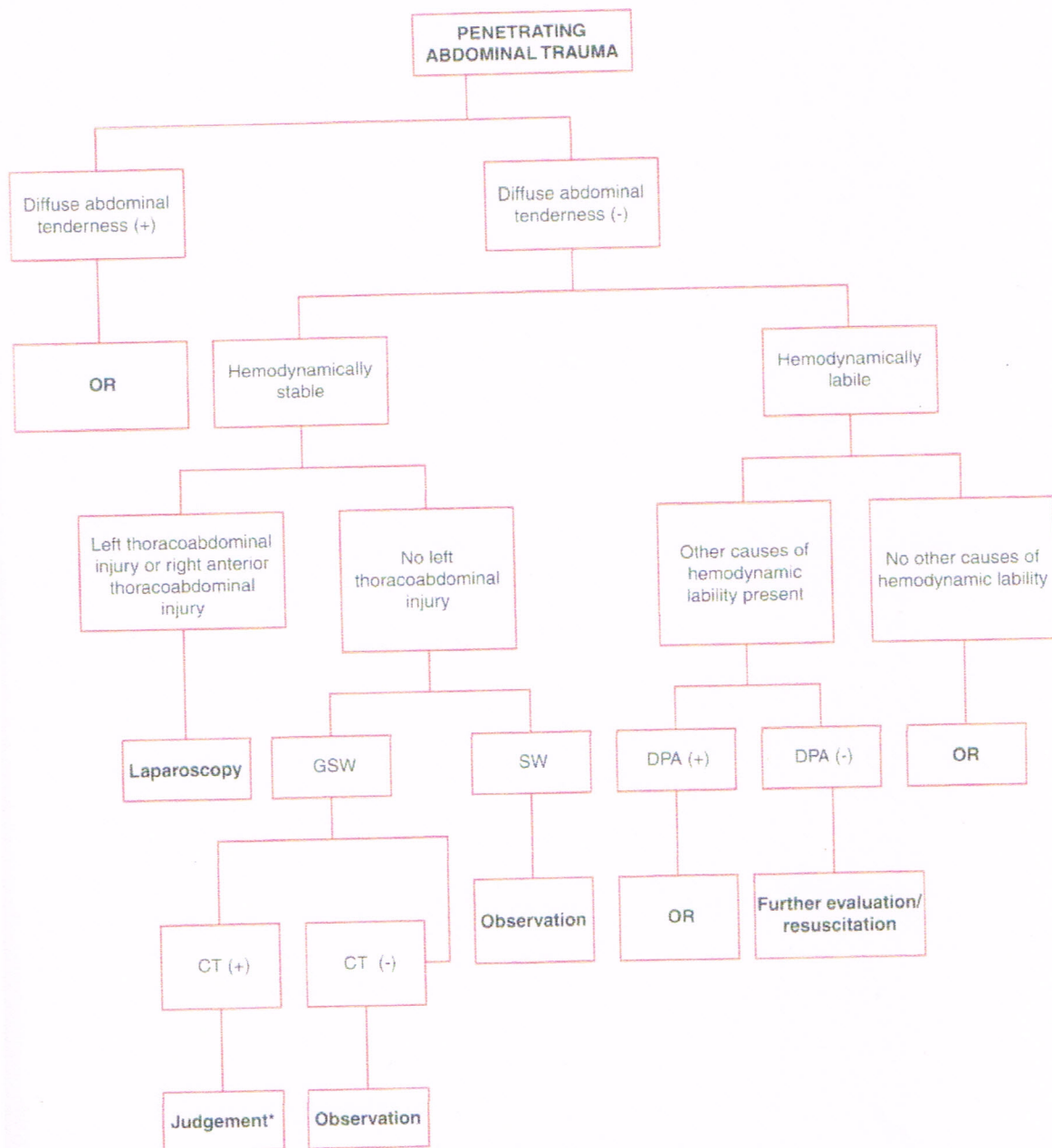
- Nyeri tekan
- Guarding dan rigidity
- Bising usus menghilang

Tanda-tanda klinis yang masih diperdebatkan untuk laparotomi (laparotomi diserahkan kepada kebijakan ahli bedahnya, hasil pengalaman, fasilitas tempat bekerja, kemampuan 24 jam observasi)

- Robekan peritoneum
- Eviserasi omentum
- Udara bebas pada foto radiologi

Jadi bagaimanakah caranya agar diagnosis tidak terlambat atau terdapat “missed injuries”?

- Pemeriksaan fisik yang teliti sejak awal
- Dilanjutkan dengan pemeriksaan berulang-ulang
- Memonitor dengan teliti status hemodinamik



GSW: gunshot wound, SW: stab wound, OR: operating room, DPA: diagnostic peritoneal aspiration

*Judgement = operation or nonoperative management according to CT findings

Feliciano, Mattox and Moore, Trauma 7th edit, 2013

Untuk melakukan penelitian pada trauma penetrans abdomen, harus ditentukan senjata apa yang digunakan, lokasi anatomi perlukaan, apakah tembus atau tidak, bagaimana keadaan umum, hasil pemeriksaan fisik lokal, juga harus dilaporkan hasil penemuan laparotomi apakah sebenarnya ada indikasi untuk laparotomi atau tidak, yaitu :

1. **Laparotomi terapeutik**, artinya sewaktu laparotomi ada organ visera yang harus direparasi secara bedah, misalnya perforasi usus, reseksi usus, thrombektomi atau rekonstruksi vaskular, reseksi liver, nefrektomi, dsb.
2. **Laparotomi yang tidak perlu (“unnecessary”)**
kerusakan organ visera minimal, tidak perlu reparasi bedah, misalnya: robekan serosa, robekan permukaan liver, perdarahan kecil yang telah berhenti sendiri
3. **Laparotomi negatif**, artinya tidak ditemukan kerusakan organ visera

TRAUMA PENETRANS ABDOMEN KARENA SENJATA API (“GUNSHOT WOUNDS”)

Berbeda dengan luka tusuk, yang indikasi laparotomi sekarang ini lebih selektif, maka pada luka tembus karena peluru senjata api, umumnya para ahli berpendapat harus dilakukan laparotomi rutin di hampir seluruh pusat pelayanan trauma.

Alasan untuk melakukan laparotomi rutin pada kasus ini

1. Disangka bahwa Insidensi terjadinya kerusakan organ intraabdominal tinggi, mendekati 90%
2. Banyak rumah sakit tidak mempunyai banyak pengalaman menangani kasus ini
3. Kalaupun ternyata laparotominya negatif, komplikasi yang terjadi dianggap dapat diabaikan
4. Pemeriksaan fisik pada kasus luka tembak sering dianggap tidak dapat dipercaya.

Dengan bertambah banyaknya pengalaman di pusat-pusat pelayanan trauma dalam menghadapi kasus luka tembak, pernyataan no.3 dan 4 tidak sepenuhnya benar, sebab ternyata laparotomi non terapeutik akan menimbulkan morbiditas sebesar 12%-40%, antara lain menyebabkan lama rawat yang memanjang.

Berdasar pengalaman dalam menangani luka tusuk, beberapa ahli berpendapat bahwa tidak ada perbedaan bermakna dalam mendiagnosa peritonitis akibat luka tusuk dan trauma tumpul abdomen, meskipun pasien tersebut ada dibawah pengaruh alkohol atau obat-obatan neurotropik. Keadaan ini ternyata dapat diterapkan juga didalam memeriksa luka tembak abdomen.

Sekelompok peneliti seperti Velmahos, Demetriades, Folanini tahun 1997, menyatakan bahwa dapat dilakukan laparotomi selektif baik untuk luka tembak abdomen anterior maupun posterior. Dari suatu studi prospektif 309 pasien luka tembak abdomen, yang dilakukan selama 16 bulan, menunjukkan bahwa 34% kasus dapat dipulangkan dalam keadaan baik, tanpa operasi.

Studi prospektif yang sama dilakukan pada 203 pasien luka tembak daerah posterior, yang dikumpulkan selama 12 bulan, ternyata sebanyak 69% pasien yang awalnya diobservasi, diantaranya sebanyak 66% dapat dipulangkan dari rumah sakit tanpa dioperasi.

Demetriades dan Velmahos melaporkan jumlah kasus luka tembak yang lebih besar lagi selama 8 tahun dari rumah sakit tempat para ahli bedah ini bekerja, yaitu meliputi 1856 pasien diantaranya luka anterior 1405 pasien, dan posterior 451 pasien. Menemukan bahwa 47% kasus tidak ada cedera intra abdomen yang berarti, (39% anterior, 74% posterior gunshot wounds). Pada 80 pasien (4%) gejala peritonitis timbul setelah observasi sehingga dilakukan "delayed laparotomy". Diantara pasien tersebut, hanya 5 pasien (0.3%) menderita komplikasi akibat keterlambatan bertindak, tetapi akhirnya sembuh tanpa mortalitas. Rata rata laparotomi nonterapeutik adalah 9%.

Dalam semua penelitian diatas, luka tembak superfisial atau tangensial tidak dimasukkan dalam penelitian. Pada pasien-pasien tertentu yang luka tembaknya mencederai organ solid seperti: liver, limpa dan ginjal tetapi hemodinamik stabil serta tanpa tanda-tanda peritonitis dapat diatasi secara nonoperatif (NOM).

Dari 152 kasus luka tembak yang mengenai liver, yaitu 7% dari semua kasus luka tembak abdomen atau 21% dari kasus cedera liver, dapat diatasi secara nonoperatif (Demetriades, dkk, 1999).

Akhir-akhir ini, pemeriksaan CT-Scan dapat membantu menilai trajek peluru dalam badan pasien dan hubungannya dengan organ-organ vital, sehingga menjadi bahan pertimbangan untuk memilih terapi non operatif. Dengan CT-Scan dapat diketahui adanya false aneurysm mampu perdarahan aktif.

TRAUMA TUMPUL ABDOMEN

Penanganan trauma tumpul abdomen berbeda dengan trauma penetrans, adanya peritonitis tetap merupakan indikasi utama untuk segera melakukan laparotomi. Tetapi berbeda dengan trauma penetrans, adanya hemodinamik yang tidak stabil tidak otomatis sebagai indikasi laparotomi, sebelum terbukti bahwa sumber perdarahan berasal dari organ intra abdominal pada pasien multi trauma tersebut.

Dalam membuat diagnosa cedera akibat trauma tumpul sering tidak cukup dengan pemeriksaan fisik saja, tetapi perlu pemeriksaaan penunjang seperti foto rontgen polos, pemeriksaan laboratorium, FAST, DPL atau DPA. Dengan bertambah baiknya alat ultrasonography dan pengalaman melakukan FAST, maka lama-lama DPL akan berkurang indikasinya. Apabila FAST negatif sedangkan hemodinamik tak stabil, harus segera dilakukan DPA ("diagnostic peritoneal aspiration"). Apabila DPA positif pasien harus segera dilaparotomi, seperti telah disebutkan diatas. Lavage umumnya tidak perlu dilakukan pada pasien hemodinamik tidak stabil, tetapi DPA lebih menentukan.

Pasien yang hemodinamik stabil, tetapi FAST tidak meyakinkan, maka perlu pemeriksaan dengan CT-Scan, untuk menentukan organ apa saja yang terkena, apakah perlu laparotomi, “non operative management” (NOM) atau embolisasi.

Keberhasilan “non operative management” untuk cedera limpa dan liver yang ringan, mencapai 70%-90%. Tetapi kemampuan CT-Scan untuk mendiagnosa cedera tumpul pada duodenum, usus halus dan colon masih diperdebatkan, ada peneliti yang berpendapat bahwa diantara 30%-50% pasien dengan tanda ada cairan bebas pada CT-Scan, kemungkinan terdapat trauma visera yang harus dioperasi. Untuk menghindari laparotomi non terapeutik, perlu pemeriksaan klinik yang teliti dan informasi hasil laboratorium seperti pemeriksaan serial analisa gas darah, DPL dan kadar enzim.

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Sertifikat

diberikan kepada

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Atas partisipasinya sebagai

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