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高等医药院校教材

临床医学双语教材

外科学 麻醉学 妇产科学

眼科学 耳鼻咽喉科学



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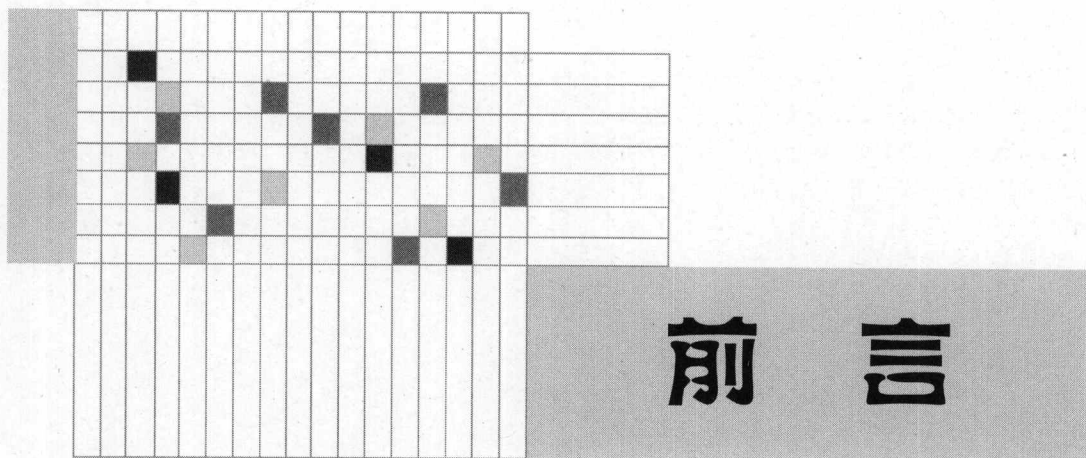
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随着高等教育步伐的加快,双语教学日益成为培养国际化人才的重要手段,临床医学教育是医学院校的主体,其双语教学的开展和应用是高校办学水平的标志。为此我们组织一批有着丰富临床医学教育经验的归国留学教师,共同编写这本实用性较强的双语教材,为推进高等临床医学双语教学的教材建设尽微薄之力。

本书分为外科学、麻醉学、妇产科学、眼科学、耳鼻咽喉科学五大部分,外科学共分五节,涉及普外、血管乳腺、骨科、胸科、泌尿等五个系统。内容均以原版英文教材为基础,重点选择了常见病、多发病和易理解的疾病进行编写,难易适中,便于学生学习和理解,可用于五年制、七年制医学生临床教学使用。

由于水平有限,书中错误之处,敬请读者指正。

编 者

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Part 1 Surgery 外科学

Chapter 1 Abdominal trauma 腹部损伤

The abdomen is frequently injured after both blunt and penetrating trauma. Approximately 25% of all trauma victims will require an abdominal exploration. The clinical evaluation of the abdomen by means of physical examination is inadequate to identify intra-abdominal injuries. This is due to the high number of patients with altered mental status secondary to head trauma, alcohol, or drugs and because of the inaccessibility of the pelvic, upper abdominal, and retroperitoneal organs to palpation. For these reasons, several diagnostic modalities evolved during the past three decades, including diagnostic peritoneal lavage, ultrasound, CT, and laparoscopy, all of them with advantages, disadvantages, and limitations.

Mechanism of injury

Blunt trauma secondary to motor vehicle accidents, motorcycle accidents, falls, assaults, and pedestrians struck remain the most frequent

钝性及穿透性损伤常伤及腹部。约 25% 的伤者需要开腹探查。仅通过腹部体格检查确定有无腹腔内损伤是不充分的。因为有相当一部分病人由于头部损伤、醉酒或服用药物而伴有意识障碍,此外盆腔脏器伤上腹部损伤以及腹膜后脏器损伤难于用触诊的方法确诊。因此在过去 30 年发展了一些诊断方法,包括诊断性腹腔盥洗、超声、CT 和腹腔镜,所有这些方法既有优点也有缺点和局限性。

一、损伤机制

由于机动车事故、摩托车事故、坠落伤、袭击伤和行人撞击伤所致的钝性伤仍然是腹部损伤最

mechanisms of abdominal injury. Penetrating abdominal wounds are usually caused by either gunshot or stab wounds and by a significantly smaller number of shotgun wounds.

Based on the high frequency of intra-abdominal organ injury after gunshot wounds, mandatory abdominal exploration, with rare exceptions, remains the standard form of management. Stab wounds to the abdomen, however, carry a significantly lower risk of intraabdominal organ injury when compared with gunshot wounds, and recently several studies have favored a more selective approach, as opposed to mandatory exploratory laparotomy.

In children, besides the previously mentioned mechanisms of injury, child abuse and trauma secondary to recreational activities, such as bicycling, swimming, and roller skating, should also be considered.

Diagnosis

The history of the traumatic event is particularly important in determining the likelihood of an intra-abdominal organ injury. All possible information should be obtained from the prehospital personnel, including mechanism of injury, height of a fall, damage to the interior and exterior of a vehicle in a motor vehicle accident, other deaths at the accident scene, ejection, vital signs, mental status, presence of external bleeding, type of weapon, and so on.

On arrival to the hospital, history and physical examination are usually accurate in determining intra-abdominal injury in the awake and responsive patient, although the limitations of the physical examination are significant. Many patients with moderate intra-abdominal bleeding will present in a compensated hemodynamic condition and will not have peritoneal signs. Furthermore, retroperitoneal and pelvic injuries cannot be ruled out based only on physical findings. We consider that an objective

常见的受伤机制。腹部贯通伤常由枪弹伤或刀刺伤引起,极少数是猎枪至损伤。

由于枪弹伤发生腹腔内脏损伤的几率高,必须行剖腹探查,除极个别情况外,手术探查仍然是标准的治疗方式。与枪弹伤相比,腹部刀刺伤发生腹腔内脏损伤的危险非常低,近来一些研究更趋于有选择性手术探查而反对必须进行剖腹探查。

在儿童,除上述受伤机制外,虐待儿童和娱乐活动中受伤,如骑车、游泳、四轮鞋滑冰也是导致腹部损伤的原因。

二、诊断

受伤病史在确定有无腹腔内脏损伤时非常重要。应尽可能获得入院前病人的情况,包括受伤机制、坠落高度、机动车事故中是在车内还是车外、事故现场其他伤者的死亡情况、排泄物、生命体征、精神状态、外出血情况以及武器的类型等信息。

病人到达医院后,对清醒及反应正常的病例,病史及体格检查常是确定腹腔内脏损伤较准确的方法,尽管其有局限性。许多有中度腹腔内出血的病例血流动力学有一定的代偿,可能并无腹膜炎体征。此外,腹膜后和骨盆损伤不能仅通过体格检查予以除外。我们认为客观的腹部检查评价是必要的并应通过各种可能的诊断方法获

abdominal evaluation is necessary and should be obtained by utilizing any of the available diagnostic modalities in addition to the physical examination. The test of choice will depend on the hemodynamic stability of the patient and the severity of associated injuries.

Hemodynamically stable patients sustaining blunt trauma are adequately evaluated by an abdominal ultrasound study or CT, unless other severe injuries take priority and the patient needs to go to the operating room before the objective abdominal evaluation. In such instances, a diagnostic peritoneal lavage is usually performed in the operating room to rule out intra-abdominal injury requiring an immediate surgical exploration.

Blunt trauma patients with hemodynamic instability should be evaluated by ultrasound in the resuscitation room, if available, or by peritoneal lavage to rule out intra-abdominal injuries as the source of blood loss and hypotension.

Patients with isolated penetrating abdominal trauma who are admitted hypotensive, in shock, or with peritoneal signs should go to the operating room despite the mechanism of injury. Stab wound victims without peritoneal signs, evisceration, or hypotension benefit from wound exploration and peritoneal lavage. Gunshot wound victims generally should undergo exploration of the wound.

Plain radiographs

The chest radiograph is a useful test to reveal pneumoperitoneum, abdominal contents in the chest (ruptured hemidiaphragm), or lower rib fractures. Fractures increase the probability of splenic and hepatic injuries.

An intravenous pyelography and a retrograde cystogram are useful tests in the evaluation of a trauma patient with hematuria.

With the current frequent use of CT to objectively evaluate the abdomen after blunt trauma in stable

得体格检查以外的资料。检查方法的选择有赖于病人的血流动力学稳定及损伤的严重程度。

在获得腹部损伤客观资料前,除非有其它更严重损伤需先行手术治疗,对血流动力学稳定的伤员应行超声学或 CT 检查。在这些有其它严重损伤的病人可在手术室行腹腔诊断性盥洗以除外需立即剖腹探查的腹内损伤。

对血流动力学不稳定的病员应在抢救室行超声学检查,或行腹腔盥洗以除外腹腔内脏损伤导致的失血或低血压。

对单纯腹部贯通伤有低血压、休克或腹膜刺激征者不论受伤机制如何应先手术治疗。无腹膜刺激征、内脏脱出或低血压的刀刺伤病人行伤道探查或腹腔盥洗有助于诊断。枪弹伤者一般需行伤道探查。

1. 普通 X 线检查

胸部 X 线检查有助于发现腹腔积气,腹腔内容进入胸腔(一侧膈肌破裂)或低位肋骨骨折。如有低位肋骨骨折可能导致脾脏和肝脏损伤。

对有血尿的外伤病例静脉肾盂造影及逆行膀胱造影是一有价值的诊断方法。

在病情稳定的腹部钝性伤病人现在常用 CT 客观评价腹部情

patients, the use of routine anteroposterior pelvic radiographs, as recommended by the advanced trauma life support course, has been questioned. One recent study examining the utility of pelvic radiography concluded that it has limited sensitivity for detecting pelvic fractures compared with CT. Stable patients undergoing CT of the abdomen and pelvis do not need a pelvic radiograph. Unstable patients, however, may continue to benefit from a pelvic radiograph because other priorities may take place that will require prompt diagnosis of a pelvic fracture in the trauma resuscitation room.

Other studies suggest that clinical factors could accurately identify patients at high risk for pelvic fractures, making routine films unnecessary.

Diagnostic peritoneal lavage

Diagnostic peritoneal lavage is a rapid and accurate test used to identify intra-abdominal injuries after blunt trauma in the hypotensive or unresponsive patient without obvious indication for abdominal exploration. Standard criteria for a positive peritoneal lavage include aspiration of at least 10mL of gross blood, a bloody lavage effluent, a red blood cell count greater than $100\,000/\text{mm}^3$, a white blood cell count greater than $500/\text{mm}^3$, an amylase value greater than 175IU/dL, or the detection of bile, bacteria, or food fibers. This test is highly sensitive to the presence of intraperitoneal blood; however, specificity is low and because a positive test prompts surgical exploration, a significant number of explorations will be nontherapeutic.

Significant injuries also may be missed by diagnostic peritoneal lavage. Diaphragmatic tears, retroperitoneal hematomas, and renal, pancreatic, duodenal, minor intestinal, and extraperitoneal bladder injuries are frequently underdiagnosed by peritoneal lavage alone. Complications are infrequent and are mostly related to iatrogenic injuries caused during insertion of the catheter into the abdominal

腔,在进一步损伤救治程序中推荐使用骨盆前后位 X 线检查的建议值得怀疑。最近一项研究显示与 CT 检查相比较 X 线检查骨盆骨折的敏感性有限。病情稳定的病人行腹部和骨盆 CT 检查者不必再行骨盆 X 线检查。然而在病情不稳定需确定有无骨盆骨折的病人,适于行骨盆 X 线检查。

其它研究显示,临床资料能准确判断有骨盆骨折高危因素的病人,无需常规 X 线检查。

2. 诊断性腹腔盥洗

对钝性损伤后低血压或无反应能力又无开腹探查指征的病员,诊断性腹腔盥洗是一快速准确的诊断方法。腹腔盥洗阳性的诊断标准是:引流全血至少 10mL、灌出液呈血性、红细胞计数大于 $100\,000/\text{mm}^3$, 白细胞计数大于 $500/\text{mm}^3$, 淀粉酶大于 175IU/dL 或检测到胆汁、细菌或食物纤维。腹腔盥洗对诊断腹腔内出血敏感性高,但特异性低,因盥洗阳性病人需手术探查而导致相当一部分病例为非治疗性探查。

在严重损伤者,诊断性腹腔盥洗亦可造成漏诊。膈肌撕裂、后腹膜血肿、肾脏、胰腺、十二指肠、小肠及腹膜外膀胱损伤常会漏诊。腹腔盥洗并发症较少,多与置管时医源性损伤有关。半切开或切开置管法可避免或减少并发症的发生。

cavity. A semi-open or open technique should be the preferred method to avoid or reduce the incidence of such complications.

Diagnostic peritoneal lavage results can be misleading in the presence of a pelvic fracture. False-positive results are expected owing to bleeding from the retroperitoneum into the peritoneal cavity.

Anterior abdominal and flank wounds can be accurately evaluated by peritoneal lavage. False-positive results are frequent after peritoneal lavage owing to bleeding of the abdominal wall, thus increasing the number of negative explorations.

Another potential disadvantage of peritoneal lavage is the low accuracy in the diagnosis of hollow viscus injuries. Debate still exists regarding the most appropriate positive criteria to determine the threshold for surgical exploration after a stab wound to the abdomen. If a red blood cell count of $1\,000/\text{mm}^3$ is considered, the number of negative explorations may be above 20%. If a count of $100\,000/\text{mm}^3$ is considered, the missed injury rate will approach 5%. There is no consensus on this matter, although most trauma centers use a low threshold (cell count between $1\,000$ and $5\,000/\text{mm}^3$) for exploration.

Diagnosis of abdominal penetration in anterior abdominal stab wounds has been evaluated by diagnostic peritoneal lavage in an attempt to determine who should potentially be discharged from the emergency department. Hemodynamically stable patients with normal physical examination were entered in the study and evaluated with closed peritoneal lavage. If the red blood cell count in the lavage fluid was greater than $1\,000/\text{mm}^3$, patients were admitted for observation. Hemodynamically stable patients with evisceration but without abdominal tenderness had the viscera reduced to the peritoneal cavity in the emergency department and they were admitted for observation. In 44 patients the red cell count was less than $1\,000/\text{mm}^3$, 34 were

在有骨盆骨折的病例,诊断性腹腔盥洗可能误导医生。腹膜后出血流入腹腔可至假阳性结果。腹腔盥洗可准确诊断前腹部和侧腹部损伤。假阳性结果多由于盥洗后腹壁出血所致,这也增加了阴性探查的比例。腹腔盥洗另一不足之处是在诊断空腔脏器损伤时准确性差。在刀刺伤后是否按腹腔盥洗最恰当的阳性标准进行手术探查仍有争议。如果在红细胞计数 $1\,000/\text{mm}^3$ 水平探查,则阴性探查率为 20%。如在 $100\,000/\text{mm}^3$ 水平探查,损伤漏诊率为 5%。虽然多数创伤中心采用更低的手术探查标准(红细胞计数在 $1\,000\sim5\,000/\text{mm}^3$),但目前仍无一致标准。诊断性腹腔盥洗已用于评估前腹壁刀刺伤所致的贯通伤病人,并确定哪些病例可离开急诊室。体格检查正常且血流动力学稳定的病例可纳入此研究并行腹腔盥洗。如果盥洗液中红细胞计数超过 $1\,000/\text{mm}^3$,病人应留院观察。血流动力学稳定但无腹部触痛的内脏脱出病人可在急诊室还纳内脏并观察。44 例腹腔盥洗液红细胞计数小于 $1\,000/\text{mm}^3$ 的病人中 34 例离院回家,并且无需手术探查亦无并发症。38 例病人因红细胞计数大于 $1\,000/\text{mm}^3$ 而留院观察。8 人出现腹膜刺激征并行剖腹探查,其中 5 人为阳性探查。作

discharged home; and none required laparotomy or developed complications. Thirty-eight patients were observed because of a red blood cell count greater than $1\,000/\text{mm}^3$. Eight developed peritoneal signs and underwent exploratory laparotomy, which was positive in five. The authors concluded that patients sustaining stab wounds can be safely discharged home if the red blood cell count is less than $1\,000/\text{mm}^3$, provided that they are hemodynamically stable and have no clear indication, based on physical examination, for operative intervention. This approach needs further validation.

Ultrasound

Ultrasound has been used more frequently in recent years in the United States for evaluation of the patient with blunt abdominal trauma. The objective of ultrasound evaluation is to search for free intraperitoneal fluid. It can be done expeditiously, and it is as accurate as diagnostic peritoneal lavage to detect hemoperitoneum. It can also evaluate the liver and the spleen once free fluid is identified, however, that is not its main purpose. Portable machines can be used in the resuscitation area or in the emergency department in the hemodynamically unstable patient without delaying the resuscitation. Another advantage of ultrasound over peritoneal lavage is its noninvasiveness. No further work-up is necessary after a negative ultrasound in a stable patient. CT of the abdomen usually follows a positive ultrasound in a stable patient. The sensitivity ranges from 85% to 99%, and the specificity from 97% to 100%.

The use of ultrasound for the evaluation of penetrating abdominal trauma has been reported only in limited, small series. Recently, a prospective study was carried out to evaluate the usefulness of ultrasound as a screening test in penetrating trauma to the same extent it is used in blunt trauma. The study included stab as well as gunshot wounds. The overall sensitivity of ultrasound was 46% and the

者认为如果刀刺伤病人红细胞计数少于 $1\,000/\text{mm}^3$, 血流动力学状态稳定, 并且体格检查又无手术探查的明确指征, 则病人可以离院回家。这种方法有待进一步验证。

3. 超声检查

近年来在美国超声已更多用于腹部钝性损伤的检查。超声诊断的客观依据是发现腹腔内游离液体。对腹腔积血超声检查迅速, 与腹腔盥洗准确度相当。如果发现有游离液体还可检查肝脏和脾脏, 但这不是超声检查的主要目的。便携式超声仪可在抢救地或急诊室对血流动力学不稳定的病人进行检查而不影响复苏。与腹腔盥洗相比, 超声检查的另一优点是无创性。超声检查阴性病情稳定的病人不需进一步检查。CT 常用于超声检查阳性病情稳定的病人。CT 检查敏感性为 85%~99%, 特异性为 97%~100%。

超声评价腹部贯通伤仅有有限的小综病例报道。最近, 一项前瞻性研究已开始评价超声检查在贯通伤筛查中的作用, 类似研究也同样在腹部钝性损伤中进行。总体上超声检查的敏感性为 46%、特异性为 94%。此研究显示, 超声检查在贯通伤诊断中不如其在钝性伤

specificity was 94%. This study shows that ultrasound in penetrating trauma is not as reliable as it is in blunt trauma. If ultrasound is positive, the patient should be operated on. If it is negative, further studies should be performed.

Abdominal CT

CT is the most frequently used method to evaluate the stable patient with blunt abdominal trauma. The retroperitoneum is best evaluated by CT. The drawback of CT is that the patient needs to be transported to the radiology department, and it is expensive compared with other tests. CT also evaluates solid organ injury, and in the stable patient with a positive ultrasound it is indicated to grade organ injury and to evaluate contrast medium extravasation. If contrast medium extravasation is seen, even in minor hepatic or splenic injuries, an exploratory laparotomy or, more recently, angiography and embolization are indicated. Another indication for CT is in the evaluation of patients with solid organ injuries initially treated nonoperatively who present with a falling hematocrit. The most important disadvantage of CT is its inability to reliably diagnose hollow viscus injury. Usually, the presence of free abdominal fluid on CT without solid organ injury should raise the suspicion of mesenteric, intestinal, or bladder injury, and an exploratory laparotomy is often warranted.

One of the most intriguing problems regarding the objective evaluation of blunt abdominal trauma by CT is what to do when free fluid without signs of solid organ or mesenteric injury is found. Coupled with the relatively poor sensitivity of CT to diagnose hollow viscus injury, it creates a dilemma for most trauma surgeons. The options are either to surgically explore all patients and accept a significant rate of nontherapeutic laparotomies or to observe and "act" when peritoneal signs develop, keeping in mind that a delay in diagnosis of bowel injury may be

中可靠。如果超声检查阳性,病人应手术治疗。如为阴性则需进一步检查。

4. 腹部 CT 检查

CT 检查常用于病情稳定的腹部钝性损伤病例。对腹膜后损伤 CT 检查非常有价值。CT 检查的缺点是病人需转运至放射科,与其它检查相比 CT 检查费用较高。CT 也用于实质性脏器损伤的检查,超声检查阳性且病情稳定的病例应行 CT 检查确定脏器损伤的程度并确定有无造影剂溢出。如果发现造影剂溢出,即使是小的肝脏或脾脏损伤也应行剖腹探查或行血管造影并栓塞出血血管。CT 检查的另一指征是实质性脏器损伤经初步非手术治疗红细胞压级下降者。CT 检查最大的缺点是不能有效诊断空腔脏器损伤。一般如 CT 检查发现腹腔有游离液体但无实质性脏器损伤者应怀疑肠系膜、肠管或膀胱损伤,这些病人常需手术探查。

令医生困惑的是如何处理 CT 检查腹腔有游离液体但无实质性脏器损伤或肠系膜损伤的病员。CT 对诊断空腔脏器损伤敏感性差,这是创伤外科医生面临的棘手问题。外科医生或选择剖腹探查但有相当比例的病人为非治疗性剖腹手术,或进行观察至有腹膜刺激征时再手术,我们必须了解延误肠管损伤的诊断可能带来灾难性后果。最近对创伤外科医生进行的调查即

catastrophic. A recent survey of trauma surgeons who were asked what would be the appropriate management of patients in this circumstance showed a variety of responses: 42% would do peritoneal lavage, 28% would observe the patient, 16% would surgically explore, and 12% would repeat an abdominal CT. The accuracy of CT ranges from 92% to 98% with low false-positive and false-negative rates.

Although the use of abdominal CT in the evaluation of penetrating abdominal trauma has been limited owing to low sensitivity in diagnosing bowel and diaphragmatic injury, newer technology (spiral CT) has been evaluated in this circumstance and thus has led to considering nonoperative management in selected cases. Nonoperative management of stab wounds to the anterior abdomen has been emphasized because of the high morbidity rate after nontherapeutic laparotomies.

In one study, triple-contrast helical CT was evaluated as a diagnostic tool after penetrating injuries to the torso. The authors concluded that CT accurately predicted the necessity of laparotomy in 95% of the patients.

Other diagnostic modalities

Despite the initial enthusiasm, the use of diagnostic laparoscopy in the patient with blunt trauma is very limited. It is an invasive and expensive method and does not seem to be superior to other methods used for decision making. Missed small bowel, splenic, and retroperitoneal injuries have been reported. It seems that laparoscopy is the best method to evaluate diaphragmatic injuries after thoracoabdominal penetrating injuries.

A study analyzing laparoscopy as a diagnostic modality in patients sustaining penetrating abdominal trauma revealed a progressive reduction in the incidence of negative laparotomies. These findings are in accordance with previous observations showing

遇到此情况如何恰当治疗时,调查结果差别较大:42%的医生认为应该作腹腔盥洗,28%的医生认为可进行观察,16%认为应手术探查,12%认为可反复多次腹部CT检查。CT检查的准确率再92%~98%之间,假阳性率和假阴性率较低。

虽然在腹部贯通伤者腹部CT检查在诊断肠管和膈肌损伤中的敏感性低,但新技术(螺旋CT)已能对此情况进行评估并对一些经选择的病例进行非手术治疗。对前腹部刀刺伤者行非手术治疗已得到认同,因为对这些病例进行非治疗性剖腹手术后并发症较高。

一项使用三期造影螺旋CT对贯通伤者进行评估的研究尚未完成。作者认为CT可在95%的病例准确预测剖腹手术的必要性。

5. 其它诊断方法

对腹部钝性损伤者行诊断性腹腔镜探查除最初使用阶段较乐观外此方法作用有限。腹腔镜探查具有侵入性且费用高,在确定治疗决策方面并不优于其它方法。已有行腹腔镜探查遗漏小肠、脾脏和腹膜后损伤的报道。在胸腹部贯通伤者行腹腔镜探查对判断有无膈肌损伤可能是最好的方法。

对腹腔镜作为腹部贯通伤的诊断方法的资料分析显示腹腔镜探查可减少阴性剖腹探查的比例。这与先前的研究结果相似,即腹腔镜探查在前腹壁刀刺伤贯通腹膜

that laparoscopy has a place in the diagnosis of peritoneal penetration after stab wounds to the anterior abdominal wall. It is particularly useful in thoracoabdominal stab wounds for detecting occult diaphragmatic wounds in the hemodynamically stable patient.

Angiography is used to evaluate renal artery thrombosis and to manage pelvic hemorrhage in patients with pelvic fractures and bleeding from minor hepatic and splenic injuries.

Gastric injuries

Gastric injuries often result from penetrating trauma. Less than 1% of such wounds are due to blunt trauma secondary to motor vehicle accidents, falls, cardiopulmonary resuscitation, or interpersonal violence.

The stomach is partially protected by the rib cage, making blunt injuries rare occurrences and relatively difficult to diagnose. Causes of blunt gastric rupture include vigorous ventilation with an endotracheal tube placed inadvertently in the esophagus, crushing against the spine, cardiopulmonary resuscitation, the Heimlich maneuver, and other causes leading to sudden increase in intraluminal pressure.

Blunt gastric trauma includes a wide range of injuries, from mucosal lacerations to full-thickness disruption and gastric necrosis due to avulsion of vascular pedicles. Other intra-abdominal and extra-abdominal injuries are frequently present. Diagnostic peritoneal lavage or CT of the abdomen may confirm the diagnosis; however, in most instances the diagnosis will be made during surgical exploration.

Any penetrating abdominal injury, particularly in the upper abdomen, should be suspected of causing injury to the stomach. During initial evaluation a nasogastric tube should be inserted; and if the aspirate is positive for blood, an injury to the stomach should be suspected. The intraoperative

者的诊断中能协助诊断。在血流动力学稳定的胸腹部刀刺伤者腹腔镜对发现隐匿性膈肌损伤有帮助。

血管造影常用于确定有无肾动脉血栓形成、治疗由于骨盆骨折导致的出血及轻度肝脾外伤后出血。

(一) 胃损伤

胃损伤常发生于贯通伤。源于机动车事故、坠落伤、心肺复苏或个人之间暴力钝性伤者不足 1%。

由于部分胃有助弓的保护,胃钝性伤极少发生且难于诊断。引起胃钝性破裂的原因有:气管内插管错插入食管并行强烈通气、撞击至脊柱、心肺复苏、Heimlich 动作以及其它导致胃腔压力突然升高的因素。

钝性胃损伤的严重程度差别较大,可以是粘膜撕裂、全层破裂或由于供应血管的撕脱导致的胃坏死。钝性胃损伤常伴有腹内其它脏器损伤。诊断性腹腔盥洗或腹部 CT 检查可明确诊断,但多数是在手术探查时确诊的。

任何腹部穿通性损伤尤其是上腹部伤,都应怀疑有无胃损伤。首先应插鼻胃管观察,如果有血性引流液应怀疑胃损伤。术中诊断包括仔细观察食管胃结合部、胃前后壁、打开胃结肠韧带以及完整观察

evaluation includes good visualization of the esophagogastric junction, examination of the anterior gastric wall, opening of the gastrocolic ligament, and complete visualization of the posterior gastric wall. Minor injuries may not be identified and require distention of the organ with saline or methylene blue to evaluate for leaking.

Most penetrating wounds are treated by means of débridement of the wound edges and primary closure in layers. Injuries with major tissue loss may be best treated by gastric resection. Postoperative complications include bleeding, usually from the submucosal vessels, intra-abdominal abscesses, and, more rarely, gastric fistula.

Due to its proximity with the diaphragm, the stomach is frequently injured after thoracoabdominal wounds. Depending on the severity of contamination due to spillage of gastric contents, empyema is another frequent complication.

The role of the extravasation of gastric contents in the genesis of postoperative complications is closely related to the dynamics of the gastric flora. Usually many microorganisms originating from the nasopharynx and oropharynx reach the stomach through the saliva and nasal mucus. Changes in gastric pH are frequent after eating, drinking, and saliva ingestion, which act in an attempt to neutralize gastric acidity. When gastric pH is below 4, gastric juice has bactericidal properties that act to inhibit bacterial enzymatic activity. In this situation, microorganisms such as *Streptococcus salivarium*, *Streptococcus viridans*, *Lactobacillus*, *Bacteroides*, *Veillonella*, *Micrococcus*, *Staphylococcus*, and *Neisseria* are found in very low concentrations, usually below 1 000/mL. Inversely, when the gastric pH is neutralized, bactericidal properties of the gastric juice are extremely suppressed, which leads to prompt bacterial growth. Concentrations can reach as high as 10^6 /mL and remain there for approximately 1

多数穿透性损伤都可行创伤边缘清创及一期分层缝合。有大量胃组织缺损者最好行胃切除术。术后并发症包括出血（常来自粘膜下血管）、腹腔内脓肿和极少见的胃瘘。

由于邻近膈肌，胸腹部伤常伴有胃损伤。损伤后的污染严重程度与溢出的胃内容物有关，腹腔脓肿也是一常见并发症。

胃内容物外溢引发术后并发症与胃内菌群的动态变化有关。许多微生物来自鼻咽和口咽部通过唾液和鼻粘液抵达胃。胃内 pH 值常在餐后、饮水及吞咽唾液而改变，这些因素可中和胃酸。胃内 pH 值低于 4 时，胃液通过抑制细菌酶类而有杀菌作用。此时在胃液中可发现低浓度唾液型链球菌、草绿色链球菌、乳杆菌、拟杆菌、韦荣球菌、微球菌、葡萄球菌和奈瑟菌，浓度常低于 1 000/mL。相反，当胃内 pH 值呈中性时，胃液中杀菌成分明显受抑制导致胃内细菌生长。细菌浓度可达 10^6 /mL 并能保持 1 小时再恢复至正常水平。如果胃酸被长期中和，在胃内可发现来自下消化道细菌，如脆弱拟杆菌、大肠杆菌和粪链杆菌。这在胃内有大量食物及液体的外伤病例尤为重要。

hour before returning to normal levels. If the neutralization occurs for prolonged periods of time, bacteria from the lower digestive tract such as *Bacteroides fragilis*, *Escherichia coli*, *Streptococcus faecalis*, and enterobacterias can be found inside the stomach. This fact is especially important in trauma patients who frequently have great amounts of food and liquid inside the stomach.

Morbidity and mortality rates after penetrating abdominal injuries associated with gastric wounds have been reported close to 27% and 14%, respectively, in most cases due to the associated injuries, although the risk of morbidity from gastric injury itself is close to 6%.

Injuries to the duodenum

The majority of duodenum injuries are caused by penetrating trauma; however, blunt injuries, although infrequent, are difficult to diagnose because patients may present with subtle findings on admission. The incidence of duodenal injuries varies from 3% to 5%. Most of duodenal injuries are accompanied by other intra-abdominal injuries. This occurs owing to its close anatomic relationship with other solid organs and major vessels.

A motor vehicle accident causing a steering wheel blow to the epigastrium is the most common mechanism of blunt duodenal injuries. Other mechanisms, such as assault and falls, also cause duodenal injuries. A closed loop compression of an air-filled loop after a direct blow can account for duodenum rupture.

The retroperitoneal location of the duodenum (second and third portions) exerts a protective effect against injuries but also prevents an early diagnosis. Isolated injury to the duodenum is rare and usually does not cause significant clinical signs of peritonitis or hemodynamic instability. A thorough search based on mechanism of injury is necessary to prevent delays in diagnosis. Failure to recognize this injury is

尽管单纯胃损伤的并发症发生率近 6%，但由于多数病例是复合伤，在伴有胃损伤的腹部贯通伤病例的死亡率和并发症发生率分别为 14% 和 27%。

(二) 十二指肠损伤

多数十二指肠损伤源于贯通伤，在钝性损伤中尽管少见，但由于病员在就医时症状轻微而难于确诊。十二指肠损伤发生率为 3%~5%。多数十二指肠损伤伴有腹内其它脏器损伤。这是由于十二指肠在解剖上与其它实质性脏器及大血管邻近的缘故。

机动车事故中十二指肠损伤最常见的原因是方向盘撞击上腹部。其它损伤机制包括，受袭击或高处坠落也可伤及十二指肠。充满气体的十二指肠闭袢在受到直接打击后容易破裂。

十二指肠腹膜后部分（第二、三段）不易受伤但也不利于伤后早期诊断。孤立性十二指肠损伤少见并且常无明显临床腹膜炎体征或血流动力学不稳定。需依据受伤机制详细检查以免延误诊断。误诊十二指肠损伤可引起腹腔内脓肿、脓毒症及增加死亡率。