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Surgical Treatment of diffuse peritonitis and severe acute pancreatitis. Source control as precondition for survival.

Abstract

Auf dem Gebiet der Allgemein Chirurgie stellt die chirurgische Behandlung sowohl der diffusen Peritonitis als auch der schweren akuten Pankreatitis (nekrotisierende Pankreatitis) trotz moderner intensivmedizinischer Möglichkeiten nach wie vor ein ernst zu nehmendes Problem dar.

Im Bereich der schweren diffusen Peritonitis führten hohe Letalitätsraten zu verschiedenen Relaparotomiekonzepten in der chirurgischen Behandlung. Schemata wie das offene Abdomen, die offene oder die geschlossene Peritoneallavage wurden jedoch zugunsten der Konzepte der geplanten Revision und der On-demand-Relaparotomie aufgegeben. Studien zeigen, dass beide Arten der Relaparotomie (geplant vs. on-demand) vergleichbare Ergebnisse erzielen. Entscheidend für den Erfolg ist nicht die Anwendung eines dieser Konzepte, sondern die möglichst rasche und konsequente Sanierung der Peritonitisquelle.

Die schwere akute Pankreatitis (nekrotisierende Pankreatitis) stellt die schwerste Form der akuten Pankreatitis dar. Nach wie vor sind die Indikation und der Zeitpunkt der operativen Therapie der schweren akuten Pankreatitis (SAP) Gegenstand heftiger Kontroversen. Akzeptierte Prinzipien der chirurgischen Therapie sind die stumpfe Nekrosektomie und die Gewährleistung einer kontinuierlichen Drainage potentiell infizierten Pankreassekrets. Bei Analyse des eigenen Krankengutes stellte sich die chirurgische Kontrolle der Pankreasnekrose im Sinne der suffizienten Nekrosektomie als Grundvoraussetzung für das Überleben dar. Der Zeitpunkt der operativen Therapie sollte so spät wie möglich gewählt werden, da die suffiziente Nekrosektomie von der ausreichenden Demarkierung des nekrotischen Gewebes abhängig ist.

Die chirurgische Therapie der diffusen Peritonitis als auch der schweren akuten Pankreatitis fokussiert auf die chirurgische Kontrolle der Peritonitisquelle bzw. der Pankreasnekrose. Der Zeitpunkt der chirurgischen Intervention sollte hinsichtlich der diffusen Peritonitis so früh wie möglich und hinsichtlich der nekrotisierenden Pankreatitis so spät wie möglich gewählt werden

A. Diffuse peritonitis

Despite continuous efforts to improve surgical management and intensive care medicine, diffuse intra-abdominal sepsis still remains a serious problem in the field of general surgery. With regard to several risk factors and patient selection, mortality varies between 20% and 55%. High mortality rates due to diffuse peritonitis lead to differing considerations resulting in numerous treatment modalities, such as open

packing, closed or open peritoneal lavage, the conceptual use of relaparotomy, either planned or 'on-demand'. None of these methods have striking results. Therefore the current trend leans towards a combination of the different strategies to give the best results and to minimize complications.

At present the surgical concepts in the therapy of diffuse peritonitis as open packing, closed or open peritoneal lavage are abandoned in favour of either on-demand or planned relaparotomy concepts .

Definition of 'on-demand' and planned relaparotomy

'on-demand' relaparotomy

This concept states that the deterioration of organ functions is the indication for re-operation. A pre-requirement is that organ functions are continuously monitored by means of intensive care medicine and are constantly evaluated and interpreted by surgeons and anaesthetists.

The main functions to be monitored are the cardiovascular system, lung, kidney, liver, hematology, coagulation as well as an increased parameter concerning necrosis, such as lactate or acidosis.

Planned relaparotomy

This concept involves re-operations according to a fixed schedule every 48 hours. The programme of planned re-operations is stopped by the responsible surgeon when the abdomen is considered to be cleared, i.e. without remaining septic source.

The surgical concepts of planned and 'on-demand' re-operation are well established strategies in the treatment of diffuse intra-abdominal infection. While until recently, various surgical concepts were under controversial discussion, there is currently a trend towards a combination of the different strategies in order to optimise therapy. At the surgical department of the Medical University Vienna we simultaneously practice 'on-demand' as well as planned revision.

The surgical clearance of the origin of sepsis is of paramount importance. By the understanding of pathophysiologic consequences, the likelihood of recovery deteriorates with the extent and duration of organ failure. This is clearly linked to a fatal outcome in the case of uncured peritonitis.

In both cases of re-operation the incidence and distribution of organ failure is comparable. The concept of re-operation does not influence organ failure. On the contrary the severity of organ failure determines outcome (1).

Conclusions: The concepts of 'on-demand' as well as planned re-operation are of importance in the surgical treatment of diffuse intra-abdominal infection. The concept of re-operation does not affect the outcome. The principle of operative treatment of intraperitoneal infections is the secure elimination of the infectious source as early as possible.

B. Severe Acute Pancreatitis

Pancreatic necrosis remains the most severe form and accounts for the majority of morbidity and mortality related to acute pancreatitis. Death occurs usually only in patients with necrotizing pancreatitis. The accepted principles of surgical management of necrotizing pancreatitis are the removal of the necrotic pancreatic tissue as well as pancreatogenic ascites out of the peritoneal cavity and the lesser sac. While in the treatment of intra-abdominal infection immediate source control has been identified as the most important determinant affecting patient outcome, up until now the timing of necrosectomy in severe acute pancreatitis (SAP) is matter of controversial debate.

Proponents of early surgery state that patients would benefit from early removal of pancreatic necrosis, leading to reduction of multisystemic complications related to enzymes and toxic substances. The rationale for the concept of delaying surgical therapy however is that a certain time has to elapse before demarcation of the necrotic tissue occurs.

Up until now SAP requiring operative treatment is a severe, life-threatening condition. Five factors correlate with the outcome of disease. Patients with fatal outcome have significantly higher APACHE II scores at admission than survivors, are older, have a higher incidence of organ failure, and suffer more often from local bacterial infection. Furthermore patients who undergo delayed operative treatment (later than 3 weeks after the onset of disease) suffer from less mortality probably due to a higher rate of successful surgical control of pancreatic necrosis.

Pancreatic necrosis is a phenomenon of severe pancreatitis and occurs early in the course of disease. All patients with necrotizing pancreatitis are found positive for necrosis within the first 4 days after the onset of the disease. Thus, the decisive period in terms of morbidity and mortality of the patients suffering from acute pancreatitis seems to be the beginning stage of the disease. The clinical severity of acute pancreatitis correlates most closely with the presence and extent of pancreatic necrosis. Literature dealing with surgical treatment of SAP focuses on the removal of necrotic tissue, either at first operation or if necessary at following re-operations by blunt necrosectomy.

Up to now no universally valid answer concerning surgical treatment in SAP has been given. The surgical goal is focused on the removal of necrotic tissue and the continuous evacuation of pancreatic fluids, which may contain bacterial and biologically active material.

The timing of pancreatic débridement has also been a matter of controversy. In a recent study we could show that a precondition of survival in surgically treated patients with SAP is the successful surgical control of pancreatic necrosis (2). As mentioned earlier, development of necrosis occurs within four days after the onset of disease. Demarcation of pancreatic necrosis evolves two to three weeks after the onset of disease, even if the exact demarcation process still has not been clearly and objectively evaluated. This demarcation on the other hand is a precondition for sufficient débridement, leading to successful surgical control of pancreatic necrosis. As known from literature dealing with the treatment of severe intra-abdominal infection the crucial point for survival is the removal of the septic source. With regard to operative therapy in SAP, most surgical concepts such as aggressive local débridement, continuous postoperative lavage, preplanned or on demand relaparotomy attempt to control local necrosis, even though SAP is an intermittent disease. As recently observed the surgical control of local necrosis in SAP is a precondition for survival. Furthermore by analysing the timing of operative treatment it could be shown that necrosectomy, performed later than three weeks after onset of disease, is associated with a higher rate of successful débridement of pancreatic necrosis, leading to less numbers of re-operations and less mortality (3).

In conclusion, delaying surgical treatment in SAP whenever possible is beneficial for the patient. The very early débridement (within the first three weeks) may be associated with an inordinately high mortality rate, stressing the importance of a conservative approach towards SAP.

C. Conclusion

The surgical therapy in patients with diffuse peritonitis or in patients with severe acute peritonitis focuses on the surgical control of the septic source and/or of pancreatic necrosis. Surgical therapy should take place in regard to diffuse peritonitis as early as possible and in regard to severe acute pancreatitis as late as possible.

References:

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