

Case report

Streptokinase may play role in expanding non-operative management of infected walled off pancreatic necrosis: Preliminary results



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ABSTRACT

Goals and background: We evaluated ex and in vivo effect of streptokinase on pancreatic necrosis to improve the success rate of pigtail catheter drainage and irrigation in infected walled off pancreatic necrosis using step up approach and also looked at potential risk of bleeding.

Experiment and clinical cases: 1000 IU/ml of streptokinase was added to 10 g. of intra-operatively obtained fresh tissue of peripancreatic necrosis and results compared to treatment with saline. Mixture was incubated for 12 h in thermostat at 37.5 °C and subjected to histopathology. Subsequently streptokinase (50,000 units thrice a day for 5 days through PCD) was used in two patients with walled off pancreatic necrosis (WOPN) not responding to step up approach and who were being considered for surgery. Grossly there was fragmentation of necrosom in streptokinase treated tissue. Microscopically complete loss of supportive collagenous framework was noted in streptokinase treated necrosom with clumping of necrotic tissue into structure-less mass. No such changes were discernible in saline treated tissue. In two patients with WOPN there was clearance of debris after streptokinase instillation. None of the patients was on thromboprophylaxis and bleeding was not noticed in any of the patients.

Conclusion: Based on ex vivo effect of streptokinase in dissolution of necrosom at periphery, we believe that in patients with walled off pancreatic necrosis (WOPN) not responding to pigtail catheter drainage and saline irrigation; streptokinase may prove to be useful adjunct.

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Introduction

Aggressive open surgical debridement of infected pancreatic necrosis has been associated with high risk of complications (34–95%) and mortality (11–39%) [1,2]. Less aggressive alternatives to open necrosectomy have been developed over the past two decades namely percutaneous drainage (PCD), minimally invasive retroperitoneal drainage and transgastric endoscopic debridement of necrosis. Recent reports have shown increasing success with these modalities, however in a subset of patients the success rate is not good. The presumed reason is that walled off pancreatic

necrosis (WOPN) may contain variable amount of solid debris. The value of drainage therapy for removal of solid debris is equivocal. Usage of large bore catheters, placement of several drains and vigorous irrigation have been tried and not found to be completely effective in all the cases [3]. In our experience ever since we started using STEP UP approach [4] in management of infected walled off pancreatic necrosis, we have observed that in some patients despite using vigorous lavage with Y connector or putting multiple catheters in one cavity, it becomes difficult to achieve complete clearance of infected material. These patients continue to suffer low grade sepsis. This is partly because of egress catheters getting blocked frequently with debris or infected material too thick for the PCDs. This lead to the necessity of using enzymatic means to defragment the debris to make it more amenable to drainage through pigtail catheters.

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In the present study we evaluated the effect of streptokinase on pancreatic necrosus ex vivo and then applied the findings to the clinical setting of walled off necrosis with simmering sepsis and residual solid infected debris not responding to percutaneous catheter irrigation and lavage.

Materials and methods

Experimental part

The peripancreatic necrosus was obtained from a patient undergoing pancreatic necrosectomy for experimental work with patient's consent. The necrosus was immediately transferred to laboratory and was washed with normal saline to clear the blood. The necrosus was divided into two parts of 10 g each and was put into petri dish. Streptokinase 1000 IU/ml was added to one sample while normal saline was added to the second sample which acted as control.

Both the samples were incubated in thermostat regulated at a temperature of 37.5 °C for 12 h. These samples were fixed in 10% formalin and stained with hematoxylin and eosin for histopathological examination.

Clinical part

After the results of the experiment, we selected two patients with walled off necrosis and solid debris who were being managed with step up approach. These patients were not responding to percutaneous catheter irrigation and lavage and were having simmering sepsis with failure to thrive. These patients were being considered for surgical intervention. We discussed with patients the results of our experiment and our familiarity with streptokinase use in empyema routinely. Both patients gave written informed

consent and then we proceeded to instill streptokinase 50,000 units thrice a day for 5 days through the percutaneous catheter as we do for loculated empyema [5]. The study was done as per Helsinki declaration.

Results

Experimental study

Gross examination

The saline treated necrosus did not show any remarkable change in the form of fragmentation as it remained intact after 12 h of treatment. The streptokinase treated necrosus showed visible fragmentation at the periphery where streptokinase came in physical contact.

Microscopic examination

As compared to control tissue (Fig. 1a) the streptokinase treated peripancreatic necrosus (Fig. 1b and c) had following changes: 1. Complete loss of architectural details, 2. Aggregation and fragmentation of necrotic tissue into acellular masses. There appeared to be complete digestion of supportive collagenous framework by fibrinolytic action of streptokinase, thereby clumping of necrotic tissue into structure-less masses.

Clinical part

Case 1

35-year male with a history of alcohol had acute severe pancreatitis Grade D. This patient was managed conservatively and discharged. However he continued to have pain abdomen with reduced appetite. He was investigated by contrast enhanced computed tomography (CECT) at 18th week following attack of

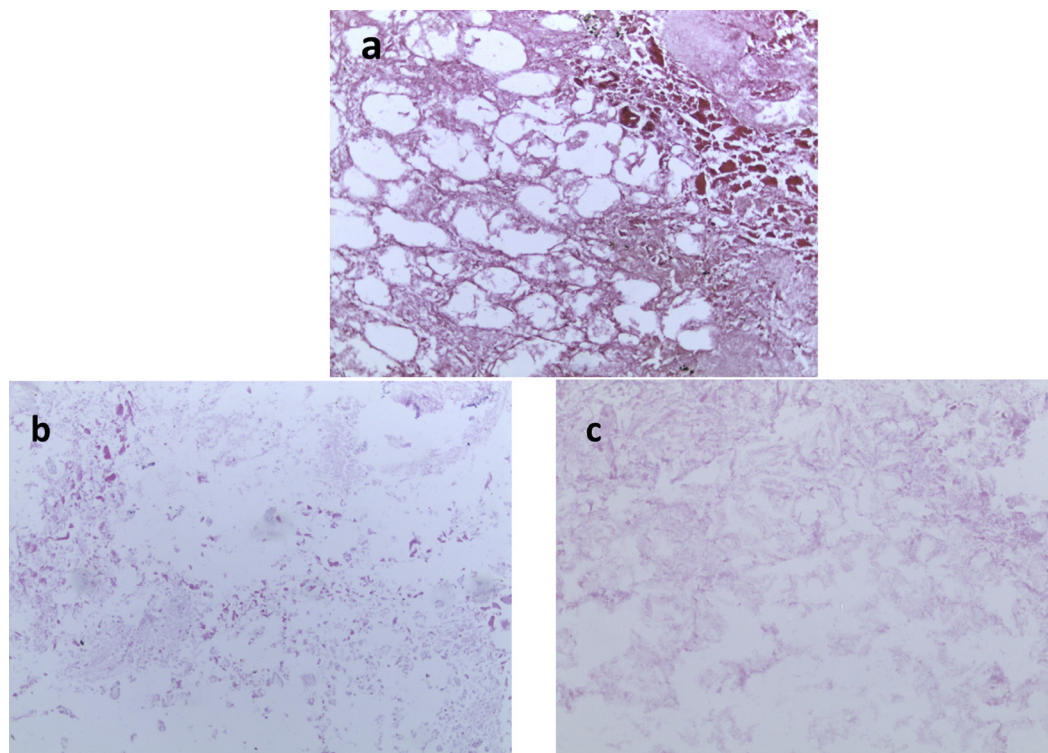


Fig. 1. a: Photomicrograph shows necrotic peripancreatic fat spaces and necrotic fibrocollagenous matrix (42E, x40), b & c: Photomicrograph shows acellular necrotic tissue mass without structural details (42E, x40).

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