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— 特別講演 —

Pancreatic problems of today

by

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First of all I want to thank you for the honor of this invitation, to talk about the problems of pancreatology that we today are all interested in. I was lucky, to work in two clinics that dedicated a lot of work to this part of medicine. I worked with Katsch, a disciple of Gustav Bergmann and with Reinwein, a disciple of Krehl. These were teams that had a close contact to your country. In this time, and in the last 4 decades, the interest in this organ has grown tremendously; especially in the last 10 years. When I was asked in 1964 to deliver a lecture on the clinic of the acute and chronic pancreatitis at the congress of the German society for internal medicine in Wiesbaden, I started this lecture with the sentence: "It is the first time in this old and respected society of internal medicine, that a main speech is delivered on the pancreas". If you go through the medical papers today, you always find plenty of publications especially on this sector of medicine.

What is the origin of this change? We got better diagnostic methods. The hidden position of this relatively small organ prevents the detection of alterations with simple clinical methods. It is too dangerous to explain complaints due to pancreas disease by diseases of better approachable organs. And often pancreatitis accompanies some other disease.

Only a part of the patients suffers from a left sided abdominal pain as it is characterized in the text books. Müller-Wieland with a bigger series of patients from our clinic once documented this pain distribution. (Fig. 1) Those patients not always look as if they had organic disease, they sometimes give you more of a psycho-neurotic sometime depressiv impression. Frequently it happens that one doubts their complaints. They like to sit in a squatting position, that french authors characterized as "Position pancreatic". According to studies of Bliss who, following cholecystectomy performed electrical stimulation of the pancreas-head, -corpus and -tail, it was demonstrated that the pain localisation was different in any different stimulation (Fig. 2). Perhaps with these experiments one can define the

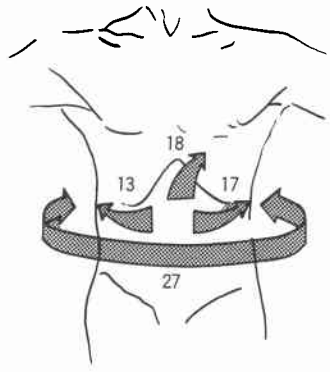


Fig.1. Frequency distribution of irrediation and belt-like in 202 patients with chronic pancreatits.

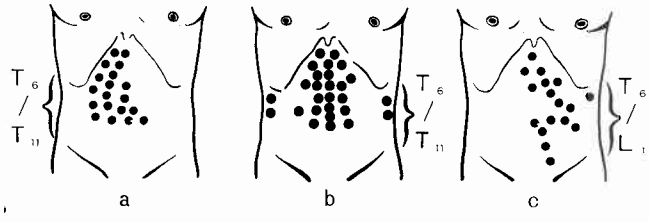


Fig. 2. Pain localization following isolated electrical stimulation of the pancreatic head, b) corpus, c) tail in 15 cholecystektomized patient according to Bliss, Burch, Martin and Zollinger (1950).

focus of the disease. If we today ask the question if any progress is made in the diagnostics with simple clinical methods, we have to say no. The only progress is that nowadays diseases of this organ are much more integrated in the differential-diagnosis, and that it has it has been possible to develope a number of technical tests and methods that enable reliable statements. They are concentrated on the analysis of the "pancreatic syndrom", due to a chronic pancreatitis, an obstruction, caused by a stenosis of the papilla or a sclerosis, a carcinoma or the forming of a cyst. Completly different is the symptomatic of acute pancreatitis; that is what the surgeons describe as the acute abdomen. I might come back this at the end.

The "pancreatic syndrom" is characterized by the pain and the less or more pronounced excretory insufficiency with all it's consequences, in some cases also by incretory disturbances like hyperglycaemia and diabetes or hypoglycaemia with the corresponding vegetative cerebral syndrom.

In the diagnostic procedures we have to distinguish between two ways: one is the demonstration of a disturbed enzyme metabolism and one is the localisation-diagnostic that always begins with x-ray studies. The conventional barium passage of the upper abdominal organs allready can provide precious hints. Especially if the affection is situated in the pancreatic nead area, The results very much depeud on the passion of the roentgenologist, who does this pancreatic diagnostic. A precious supplement is the hypotonic duodenogramm that allows a much better demonstration of the in testinal contures. After intravenous adm-

inistration of Buscopan, the barium enema together with Xylocain is given through a duodenal tube. Imprimations in the gastric region are possible, only if a marked enlargement of the organ exists as in cysts, Pseudocysts or in Neoplasmas. The effect on the bile duct system can be dominating especially in malignant diseases of the pancreatic head. But Courvoisier's sign is rarely seen in jaundice without grave pain. It is found in about nearly one fifth of the pancreatic head carcinomas, and then mainly in the later stages.

A great progress is the angiography, the visibilisation of the organ through the vasculatur. Coeliography can be sufficient, but we prefer the selective or superselective demonstration of the pancreatic vessels, a technique that gives exiellent results in the hands of our roentgenologist Wehling. In this way we succeed in catching benign and malignant tumors, but also chronic pancreatic alterations. Concerning the localisation, it is possible to make clear statments allready before surgery.

The advantage of such a selective technique, is the demonstration of the pancreatic vessel architecture without overshadowing. Statements concerning the parenchyma, and also the late venous phase are possible. Especially the space occupying lesions: pseudo cysts, carcinoma, islet cell tumors, and gastrin-producing tumors can be localized. Their existence can be derived from clinical hints. The acute pancreatitis in the case history suggests the possible presence of pseudo cysts, even if they are not palpable, because of their position or their small size. If a marked hypoglycemic-syndrom is diagnosed, one always has to consider an islet cell tumor. Suspicion of a Zollinger-Ellison-syndrom bears the obligation to look for an intrapancreatic tumor. Less characteristic is the symptomatology of an early stage pancreas carcinoma. The angiographic finding is very important and may help to make this diagnosis. Occasionally such a carcinoma has to be considered if paraneoplastic signs are present-especially thrombophlebitis of an unusual locallisation. In the search of a car-

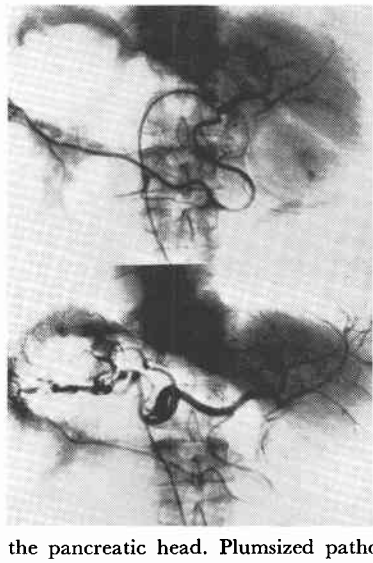


Fig. 3. Carcinoma of the pancreatic head. Plumsized pathological vessel distribution close to the origin of Gastroduodenal Artery Compact filled gall-bladder.

cinoma the similar symptomatology not seldom leads to the detection of a pancreatitis, that occasionally becomes visible in the angiogramm (Fig. 3, 4a, 5). I am sure you made similar observations in your gastroenterologic departments, but it seemed important to me, to make a short summary of these methods. With the angiography and the duodenoscopy

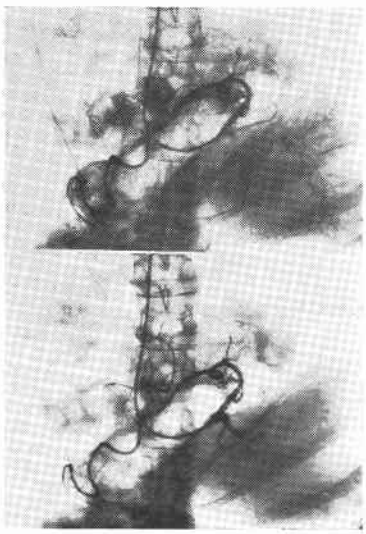


Fig. 4a. Hyperinsulinism caused by 2 Insulinomas: the medil tumor is benign. the lateral is malignant.

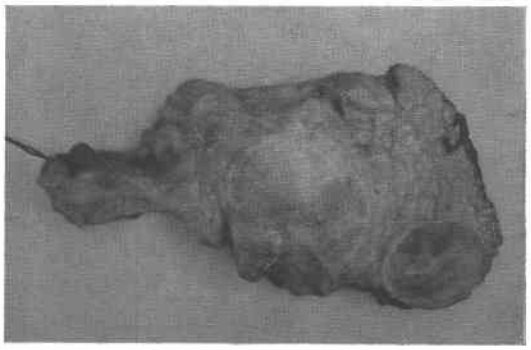


Fig. 4b. State following resection of the tumors of Fig. 4a.

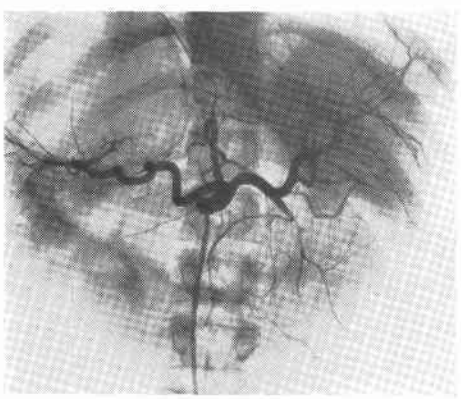


Fig. 5. Chronic pancreatitis. Alteration of the small vessels in the pancreatic head area.

evidently a new epoch of pancreas-diagnostics has begun with great benefits especially for the surgeons. Angiography finds its limitation in arteriosclerotic alterations in the small pelvis of the geriatric patients, making the insertion of the catheter difficult. The great variability of the vessel-architecture sometimes makes interpretation difficult. The utmost reliability may be gained, if together with angiography the endoskopic visibilisation of the duct system from the duodenum is performed. With this combination a perfect and re-

presentative picture of this organ isobtained.

Duodenoskopy we thankfully owe to a great degree to technically gifted scientists of your country. Their work enabled to an inconceivable extent the visibilisation of various regions in the gastrointestinal tract. In Germany especially the Erlangen gastroenterologists used this technique, and some of these slides I borrowed from Mr. Demling. With a glance in the lumen of the duodenum, especially in the pars descendens area a reaction on a disease of the pancreatic head or an invasive pancreatic head carcinoma, or stenosis due to a pancreas anulare can be seen. Direct inspection of alterations of the papilla are possible. The in-

Fig. 6. Chronic pancreatitis with pronounced widening of the Wirsungian Duct.

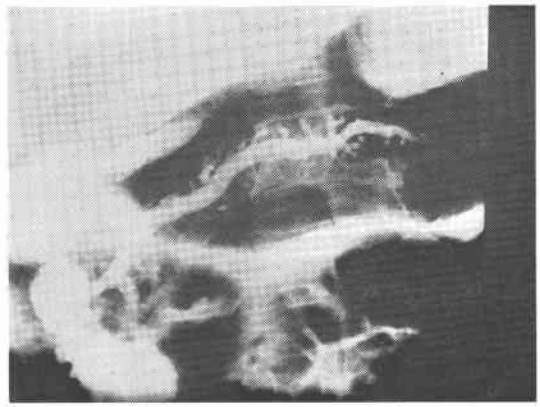


Fig. 7. Chronic pancreatitis with dilatation of the duct and shortening of the side brances.

tubation of the ducts allows a demonstration of the biliary and pancreatic duct system. If the contrast media travels beyond the main ducts the visualisation of the whole organ may be possible. Thus the Erlangen group demonstrated the duct system in approximately 400 cases and strongly indicated that an objective proof of pancreatitis is possible with this instrument. (Fig. 6,7). The wishful ideas of the endoskopists induce new developments and the question arises if we could not inspect the narrow ramifications of the pancreatic ducts with a thin fibre glas bundle. Classen did this successfully during surgery. So it might be possible to find, and may be remove concrements supporting pancreatitis, that escaped the roentgenologist.

For me, a close cooperation between the internist, performing the endoskopy, the roentgenologist, and surgeon, responsible for further treatment seems of great importance.

In short, I want to define the role of laparoskopy. Of course it is inferior to a Laparotomy, if pancreatic disease must be found. But the left hepatic lobe can be lifted with an instrument and then the pancreas can be seen through the transparent omentum minus. With an additional instrument even palpation and biopsy is possible—according to Meyer-Burgh of Berlin. The qualified question can be asked, if not the diagnostic laparotomy in the hands of a surgeon

who is ready to take the therapeutical consequences after opening of the abdomen, would be better for the patients.

A vivid discussion arouse about the szintigraphic approach of this organ. The main advantage is the fact, that it does not bother the patient, a disadvantage is the considerable amount of radiation. The radiation effect is that big, that the specialist for nuclear medicine Hundeshagen in Germany, gives the advise not to perform such an examination in individuals, younger than 35. He also thinks that the normal pancreasszintigramm using 75 Selen-Methionin allows reliable statments in only 35% of the cases. He developed an extremely complicated method, using a very expensive apparatus. With a rapid scanner and computer, multiple scintigramms of the pancreas and later of the liver—using colloidal 198 Gold—are recorded. After computation of the various isotope informations an isolated picture of the pancreas is obtained. Thus scintillation-defects are found in space occupiing lesions. Diffusely distributed defects may indicate chronic pancreatitis. One result is the conclusion that a normal pancreas scintigramm documents the absence of pathological alterations. Yet there is no ruling opinion about the diagnostic value of pancreas scintigraphy in Germany. Some clinics favour this method some gave it up again.

One technique that Rettenmaier in Erlangen has started with great passion- the ultrasonic diagnosis of the pancreas- does neither stress nor bother the patient. It works on the principle of echo sound. Almost no demarkation of the normal organ is obtained, but enlargement of some degree can be demonstrated. He says, that 90% of pancreatic cysts to a diamter of 2 cm, can be distinguished because of the different sonographic reflection of their liquid content, compared with the surrounding tissue. Generally chronic pancreatitis was characterized by an enlargement of the organ, only in long time pancreatitis with a burned out parenchyma this enlargement was missed. But still, also in those cases certain abnormal structures were found. Pancreatic tumors could be verified in 80% of the carcinoma. Small hormonal active adenomas are much more difficult to find. This technique probably needs the skilled and experienced specialist. It is simple, fast, without any risk, and can be repeated ad libitum. Therefore it is justified for the work of specific teams. Fig. 8. il-

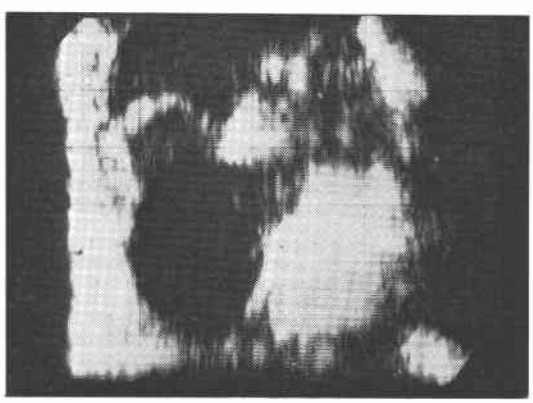


Fig. 8. Sonogramm of a big pseudo-cyst in the candal part of the pancreas.

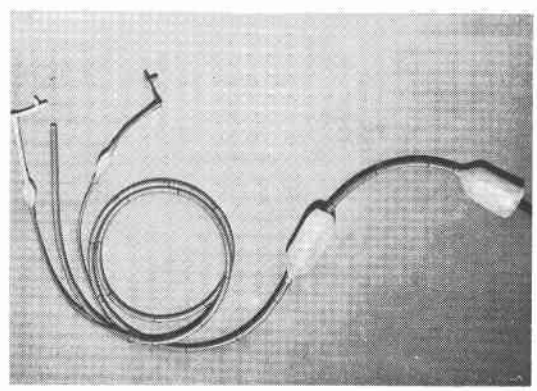


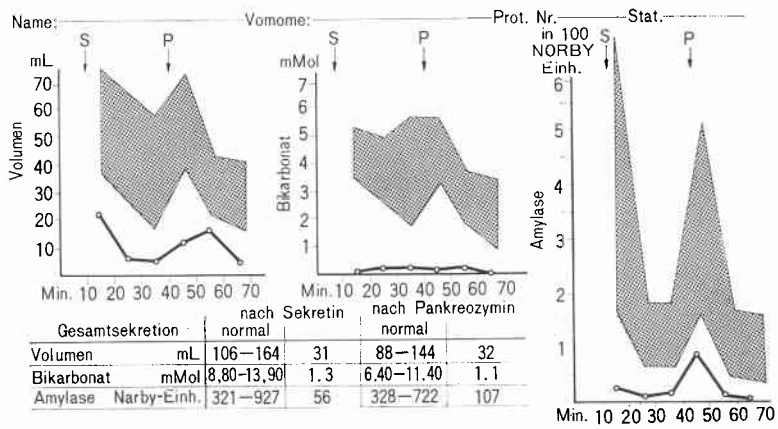
Fig. 9. Bartelheimer- Double-Balloon-Tube.

lustrates that.

I started with the diagnostic procedures that are most important for your surgical work. With them not only the pancreatic disturbance, but also the type of the disease can be recognized. Except for the acute pancreatitis the patient normally is seen by an internist, who wants to prove an underlying disturbance, using a clinical function diagnostic. Initially we want to know if the serum enzymes are elevated. We speak of a enzyme disaster Fermententgleisung (Katsch). This determination is a proper check up especially if not only amylase is determined but also an increase of the more specific lipase. My former coworker Ritter thinks, that also the maltase or glucosidase-levels are of special importance. In acute inflamation, in secretum retention, the measured values are especially high, in the burnt-out organ-that still may be painfull, they may be normal. The attempt, to receive more informations by injection of the physiological stimulator pancreozymin in the so called Evocationtest has not fullfilled the original expectations as a specific agent. In Germany many clinics dropped this test again. For monitoring of the course of the disease, the serum enzyme level is not relevant, there is no narrow correlation to the painsyndrom and none to the development of the inflamation.

Of special interest is the study that Ammann has stressed: the decreased chymotrypsin content of the stool in cases with decreased enzyme excretion. We have no experience with that method.

We ourselves were very early interested in the question, if it was possible to examine the pancreatic excretory function by sampling the duodenal juice. We developed a special tube with two balloons and two channels serving for the blocking of the duodenum and a wider middle channel for the sampling of the duodenal juice (Fig. 9). The juice of course is a mixture of mainly pancreatic and biliary excretum. We examine the volume, the bicarbonate content, and the quantity of the excreted enzymes. Berndt in our clinic has studied this method and especially Rick in Düsseldorf. Using this technique, a decreased



Gesamtsekretion		nach Sekretin normal		nach Pankreozymin normal	
Volumen	mL	106—164	31	88—144	32
Bikarbonat	mMol	8,80-13,90	1.3	6,40—11.40	1.1
Amylase Narby-Einh.		321—927	56	328—722	107

Fig. 10. Excretory pancreas function in burned-out pancreas.

enzyme-production and excretion of the pancreas can be detected. We were able to show, that in pancreatic damage the excretion of the different enzyme is not uniformely disturbed and speak of a "enzyme dissociation". (Fig. 10)

For you, as surgeons, the proof of an insufficient production of enzymes could make the decision for pancreatectomy easier, if the pain in chronic pancreatitis cau not be controlled with medication or operation of the ducts. The deficit of the incretory function can be compensated with relatively low insulin doses. Without difficulties it is possible to substitute enough enzyme to regain a sufficient digestion of the food. There are patients where the management has been successful for many years. The longest observation in Germany is of Vosschulte who in 1956 did the surgery on a patient who is still in good shape today. Obviously the situration of these patients is very different, most of these have been operated for a pancreas carcinoma. Sure, they all need careful control.

Lack of the pancreas, results in a veriable intestinal malabsorption. I want to stress the impaired calcium metabolism that may result in a secondary Hypoparathyreoidism. One of the consequences is a gradual development of calcipeqic osteopathies-osteoporosis combined with signes of a generalized fibrosing ostitis, that can be proved with a biopsy in most of the cases. We developed a simple procedure that I ask your attention for: The bone biopsy of the pelvic crest (Fig. 11). The histological examination permit the diagnosis of parathyroid

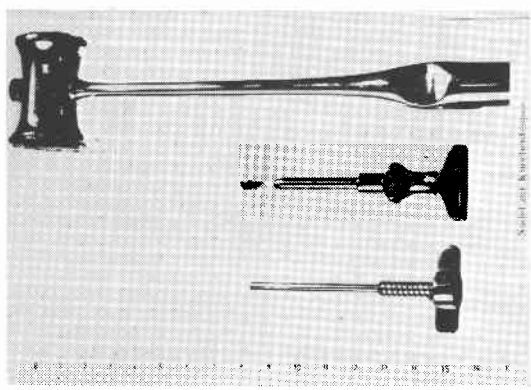


Fig. 11. Bartelheimer-Punch for pelvic-crest-biopsy.

hyperfunction. The study of the bone metabolism is of specific usefulness for this diagnosis, as Kuhlencordt from our clinic has shown.

Statical impairment of the skeleton in most of the cases occurs only, if the steatorrhea is dominant, with a pronounced loss of calcium and Vitamin D. We then find the clinical picture of osteomalacia. But I want to make the point that those findings are not frequent among patients with excretory pancreatic insufficiency. We have seen only a few cases, sometimes with various etiological components as inactivity and senium. One always should consider a possible "calcipenic osteopathy" in the pancreatectomized patient, since the complaints generally are not characteristic. In the beginning they consist of a decreased vitality,

adynamia, and uncharacteristic back pain, and by the way no calcification of tissues as in the primary Hyperparathyreoidism, occurs.

The relationship between the Parathyroid gland and the pancreas had kept a second interesting aspect for us. In a certain percentage of patients with a primary Hyperparathyreoidism a pancreatic calcinosis of various degrees is found. A tendency for the formation of calcium deposits is also found in other organs, especially in the kidney. In the pancreas also they frequently are the cause of a disease. Some facts support the dependence from the degree, and duration of the Hypercalcaemia, but not always is a pancreatic syndrom found. The initiation of a pancreatitis is not inevitable. Perhaps the simultaneous formation of pancreatic stones plays an important part. So it is neseccary, to consider Hyperparathyreeoidism if roentgenologically proved pancreatic calcifications are present. The causal therapy would be the exstirpation of the adenoma.

This form of pancreas calcification must be distinguished from the calcifiing pancreatitis; that evidently has nothing in common with the hyperfunction of the parathyroid. One mainly finds it during the development of pancreatitis in the chronic alcoholic. I want to remind you of the convincing studies of Sarles. Here the pain-syndrom is grave. The excretory insufficiency can be proved. These patients tend to develop carcinoma up to a frequency of 5% this again makes the indication for surgical intervention easier.

The topic of this lecture leaves no time to talk about the etiology and pathogenesis of pancreatitis. I only want to say that much: satellite pancreatitis of the milder form is frequent and often accompanies affection of the gastroduodenal- and biliary-system. Doerr published post mortem figures, indicating the history of imflamatory pancreatic attacks in 90% of his autopsies. Normally the pancreatitis disappears with the underlying disease.

As I said in the beginning: acute pancreatitis has a completely different clinical expression: the acute abdominal syndrome. The surgeon very often is the first to see these patients. It is our opinion that even nowadays conservative therapy must be applied in the majority of the cases-with shock treatment, continuous suction of the gastric juice and-zero food. In cases with a pronounced shock tendency, we also use trasylol-infusion as enzyme-inhibitors and act in accord with our surgeons.

A different problem derives from pseudo cysts-they can gain huge dimensions and effect the neighbourhood organs-and produce a secretion stop, if they develop within the pancreas, supporting a localized pancreatitis. Here we wish surgical help, in the interval following the acute stage.

One of our main problems is the early detection of pancreaticis carcinoma. As I said, it often starts with a poor symptomatology and gradually develops the clinical picture, that we described as pancreatic syndrom. That has to be distinguished from chronic pancreatitis. The best diagnostic is the angiopraphy: sadly enough, most of these patients, if they enter the clinic, come too late for surgery. But as a rule, in any case where no metastases can be demonstrated, a laparotomia should be performed. Stelzner and Schreiber, with whom

we cooperate, in those cases performed particular total pancreatektomy and then sent those patients to our clinic for post-operative care. Concerning the surgical procedure you are in closer touch with those problems then the internist.

I hope, I was successful in demonstrating some of the essential problems of modern pancreatology. I wished to illustrate how we today in Germany see the different points. The aim of all our actions is to make an early diagnosis and perform an early therapy. Only if this can be obtained, we get satisfying results.