



# Helping us treat “untreatable” patients

## Who/where

Academic Medical Center  
Location: Amsterdam, the Netherlands  
Type: Leading university hospital in the Netherlands.  
1,010 beds and 7,000 employees

Prof. Dr. P. Fockens MD, chair of gastroenterology and hepatology

Dr. J. van Hooft, gastroenterologist

## Challenge

Treat challenging cases of patients suffering from biliary or pancreatic diseases that could not be treated by other hospitals.

## Solution

Philips MultiDiagnost Eleva high-resolution X-ray system provides better insight into complex biliary anatomy. It allows the physician to treat complex cases due to its advanced image quality combined with its superb flexibility.

In its dedicated interventional gastroenterology suite, the Gastro-Intestinal Oncology Center Amsterdam (GIOCA) is able to treat “untreatable” patients who suffer from biliary or pancreatic diseases. Philips MultiDiagnost Eleva high-resolution X-ray system with a special ERCP package is key to their success. It provides better insight into complex biliary anatomy, applies low levels of X-ray dose, and enhances patient and staff comfort.

The GIOCA is one of the country’s top tertiary referral centers, and receives the most challenging cases from hospitals across the country. These are patients who suffer from cancers of the pancreas, biliary duct, liver, esophagus, stomach, colon, or rectum. The center receives many cases that have failed or could not be treated by other hospitals.

## A shift in the field

Prof. Dr. P. Fockens MD, chair of the gastroenterology and hepatology department, has seen many changes in the field over the past decades.

“Twenty-five years ago, you would have a patient with gastro-intestinal bleeding and the endoscopist would go in and tell the surgeon where the ulcer was, then the surgeon would operate on the patient. In the hospital I worked in at that time, that was our role as internists.

Now surgeons never operate on a patient with GI bleeding, instead we perform the intervention.”

This is in part due to sub-specialization. “The internist you meet now is an oncologist, a vascular specialist or an endocrinologist. We are doing a lot more interventional procedures, so we actually operate on our own patients more.”

“GIOCA receives the most challenging cases.”



Prof. Dr. P. Fockens MD

# PHILIPS

This shift to minimally invasive procedures has changed equipment requirements.

“There is a clear trend for hospitals to move to dedicated use of equipment in gastroenterology, with high-resolution endoscopes and X-ray images. That’s because the things we do today are much more precise than what we did years ago. There is excellent ERCP done outside our facility for simple stones, etc., but there are a lot of failed cases, difficult intra-hepatic problems that we get for treatment. We are using thinner wires and removing bigger stones. We have started placing fiducials inside tumors.” says Fockens.

#### **More comfortable for long ERCP procedures**

The MultiDiagnost Eleva is also uniquely suited to ERCP procedures, according to Fockens. “The room and table had to fit our needs for Gastro procedures, which Philips was accustomed to compared to other vendors. They knew that the patients lie on their stomach and that access from the right, made possible with the left suspended table, makes things much more convenient.”

#### **A new level of imaging support**

That is why the hospital chose Philips MultiDiagnost Eleva with an ERCP clinical package for its dedicated interventional GI room. For ERCP procedures, it is important to obtain a detailed visualization of complex vasculature from multiple viewing angles. The C-arm of the MultiDiagnost Eleva can be rotated and angulated to virtually any projection to provide enhanced insight into the complex anatomy of the biliary system.

#### **Dedicated interventional GI room is the future**

“The quality of X-ray images that we worked with ten years ago would probably not be acceptable anymore.” Fockens adds, “Some of our current stents are nitinol with some gold markers on them, and they are extremely difficult to visualize if you have bad image quality. I am happy we have the image quality of the MultiDiagnost Eleva.”

“In the future, new hospitals or hospitals that are remodeling are likely to have a dedicated interventional GI room,” says Fockens. “Going forward, that will be the norm.”

#### **Insight into complex anatomy**

Dr. J. van Hooft, gastroenterologist, specializes in hepatic-pancreatic-biliary (HPB) problems and oncological diseases. The anatomy of these patients often makes it difficult to access the desired area of the gastro-intestinal tract or biliary tree. About 70-80% of her patients have HPB conditions. She performs over 150 ERCP procedures per year, which is well above average for a gastroenterologist in the Netherlands. “Diagnostic ERCP is no longer done,” says van Hooft.

“You have such other good imaging possibilities and we mostly do MRCP. This vital preparation step allows the team to immediately start the intervention.”

Van Hooft says, “I worked in another hospital and we had a fixed X-ray system, so you could go up and down, but it could not tilt. If you wanted to go in another direction and had to turn a patient of 80 to 100 kilos

who was asleep, that was really difficult. That is one of the big advantages of Philips MultiDiagnost Eleva system, it can move in many directions.”

#### **Projection flexibility for optimal treatment view**

Moving the C-arm is also more convenient compared to mobile C-arms according to van Hooft. “The mobile C-arm I previously had to work with was quite harsh, because during the procedures we were constantly changing the position of the system manually to go to really specific side branches. This takes a lot of effort and is very time-consuming. You often have a very short moment to put in your wires. And if you also have to handle such a machine, that is not really practical for dynamic procedures.”

“3D application definitely adds value to procedures”



Dr. J. van Hooft

“The quality of X-ray images that we worked with ten years ago would probably not be acceptable anymore.”

"For a disease like Klatskin, which is intra-biliary obstruction, I think we and our patients really benefit from the MultiDiagnost Eleva."

### **3D images for confidence during navigation**

The 3D-RX imaging makes a critical difference for the center's patients who are undergoing biliary drainage procedures.

"Once you have found the position which allows you to see the branching off, you can also keep the system in that direction, so you can really work in that plane," says van Hooft.

"It gives us opportunities. It enables us to do drainages that you would not be able to do elsewhere. It's not a matter of saving time, I think otherwise you would just fail."

This is particularly important for imaging the biliary tree because of its tortuous structure. "Sometimes if you look at the 2D you think, I just have to go in that direction. But if you look at it from a slightly different angle you see that it is branching and veering off. And the shape of the tree is different for every patient," says van Hooft.

"Recently, for instance, I had to treat a patient with a Klatskin tumor. You know beforehand that you have to go to a specific branch of the biliary tree.

But if you want to get to that branch you have to be able to rotate and angulate your X-ray machine to get as close as possible to a 3D image. In my opinion, the 3D run which you see directly on the screen gives a lot of information. You get an idea about exactly where you have to place your wire to get into that specific branch. I would not have managed without having this really good fluoroscopy image. The alternative would be placing a drain on the outside of the body, which is very inconvenient and not good for a patient's quality of life. For a disease like Klatskin, which is an intra-biliary obstruction, I think we and our patients really benefit from the MultiDiagnost Eleva."

### **DoseWise for Dose management**

Van Hooft has been using the MultiDiagnost Eleva for three years in the ERCP room, and has noticed that she and her staff are exposed to very little radiation.

"In the AMC we regularly measure the radiation we receive. This is especially important because of the many hours that the team spends in the ERCP room."

"Being able to change the Source Image distance (SID) also means that we get less radiation. That is very important for me and

our nursing staff in the short term and in the long term."

Low X-ray dose also benefits the center's patients. This is one of the few facilities in the Netherlands that performs ERCP procedures on newborn infants and older children who are vulnerable to high levels of radiation. The MultiDiagnost Eleva automatically adapts the exposure to the age of the child to further reduce the radiation exposure to the child and environment.

"Being able to change the Source Image distance (SID) also means that we get less radiation. That is very important for me and our nursing staff in the short term and in the long term."

# Case study

## Endoscopic intervention challenge

Complex anatomy remains a challenge for performing a successful endoscopic intervention of the biliary tree. Without the option of a rotatable X-ray system we might have missed the low branching of the cystic duct as well as the anatomic variation of the pancreatic duct.

## Conclusion: Ansa Pancreaticus.

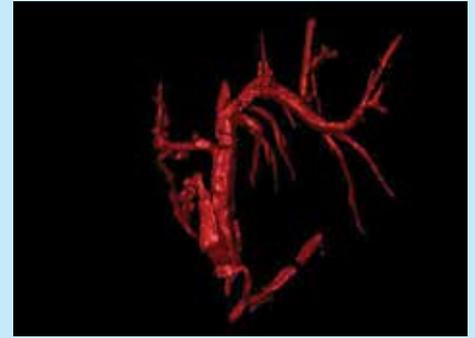
At 2 cm proximal of the papilla major, a strong angulation of the left and right ductus hepaticus, where the ductus cysticus branches off from the right ductus hepaticus.



2D image of Biliary tree



3D image of ductus pancreaticus and Biliary tree



3D image showing the complex anatomy

Please visit [www.philips.com/multidiagnosteleva](http://www.philips.com/multidiagnosteleva)



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[healthcare@philips.com](mailto:healthcare@philips.com)

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