

# **“The Cross Correlation Between The Gastrointestinal Tract and Circulatory System”**

**(Gastrocardia Symptom-Complex)**

**Later known as Roemheld Syndrome (RS),  
Roemheld-Techlenburg-Ceconi-Syndrome or gastric-cardia**

**Dr. Ludwig Roemheld, 1931 (1871–1938)**

*Wechselbeziehungen zwischen Verdauungs und Zirkulationsapparat*

*Gastrokardialer Symptomenkomplex*

*Geheimrat Dr. L. Roemheld.*

*(Geheimrat means he had in a position of public service; either at a public or state run facility such as a hospital or a university at that time.)*

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The question related to the interconnection or relation between the various individual organs and organ systems within our body is as old as the medical sciences. Von Krehl was right in writing that life in general does not know isolated organs, rather, these are a figment of our imagination and a way of looking at these things by separating them.

Whenever it comes to teaching medical sciences, this may be a useful way of seeing things. However, it is wrong to assume that every organ is an island upon itself and can work independently of the other organs. That would be a purely materialistic and mechanistic way of thinking. Underlying this idea of separation would be an assumption that the human body is nothing more than just a very complicated mechanical machine.

In reality however, the functions of the organs are related to each other and one function is smoothly connected to the function of another organ. Hence, they are all connected together and only when seeing this operation between the various organs we can understand this as a living whole. Taking one organ system out of this mechanism is in theory thinkable; however, practically it cannot be done.

Just thinking about particular organs however, for example the stomach, this experiment can be done and it was successful, but that is because one other part of the gastrointestinal apparatus (bowels) was taking the place of the stomach.

The relations between each individual organ and organ systems among each other are governed by rules and there are basically four different ways of how they are correlated and interdependent.

Firstly, there are correlations between genes of the individual organs. Hence, some correlations are genetically or phylogenetically determined; for example, the urogenital system. Another aspect is the mechanical or the location relation between two organs. So, one disease can spread from one organ to the other when they are closely related to each other. In general, this would be the most common way of transferring disease between two organs. One example that we can think of is pneumonia. Pneumonia can degenerate into pleurisy and this can then continue to become pericarditis.

Another aspect is the nervous system and the blood vessels, including the lymphatic systems. The nervous system, the blood vessels and the lymphatic systems too are correlating organs.

In the case of nervous systems, it would happen by transportation of information or through the blood vessels; therefore, there would appear the chemical or hormonal aspect of one organ influencing another.

I will not talk about these generally known aspects any further. In most

cases when we are talking about diseases and the transfer of diseases between or amongst different organs, one of those four ways should be the right one. However, in general it is very difficult to discern which one it is. Usually it will be a mixture of those four ways.

So now let's pass to the actual topic of this document, which is the correlation between the gastrointestinal system, the blood vessels, and the heart system. In particular, I would like to mention the correlation between the stomach and the heart. The stomach and the heart are located next to each other. They are separated by just a relatively thin muscular membrane, called the diaphragm. The diaphragm is covered in mucus on each side. Since the diaphragm is changing its location, with every breath we take there are constantly changes in the correlation between the stomach and the heart.

Whenever we look at a regular or healthy heart, we can see its pulsation. On the other hand, we can only see the contents of the stomach when it has been pulled up to the upper left-end side of the body. I have attached two x-rays attached to this document which were published by Auckland in the *Hiatus diaphragmatus*. But this doesn't happen only in the case of the normal, healthy heart. We can see some correlations between the two organs even in unhealthy circumstances, simply because they are closely related to each other from a mechanical point of view. Whenever one organ is expanded for whatever reason, there will be an influence on the other one.

Another aspect is that the stomach and the heart are basically innervated by the same nerves. Hence, there will always exist nerve-induced correlations between those two organs. Sometimes, this makes it very, very difficult to clearly decide which one of these two organs is actually sick and which one is only following up or is only being adversely influenced by the disease of the other one.

We will first of all consider the heart, the organ that is leading in the disease and how this will be influencing the stomach. Whenever we observe an insufficient functioning of the heart, for whatever reason it may be, we can also observe stomach congestion.

This congestion will firstly be observed on the locus of the stomach. This is the reason why patients with heart problems are very often complaining about stomach problems and very often they go to see their doctor for stomach problems. Actually, heart patients are very often seeking the assistance of a stomach specialist rather than consulting a heart specialist. Hence, so-called gastritis would be an inflammation of the stomach because of the congestion and it can be found whenever there is a heart problem related to the right or to the left ventricle, and the pain felt by these patients is well-known. They also experience loss of appetite, heartburn pressure and the feeling of pressure in the stomach, but vomiting is rather uncommon.

In general, the cause of these observations should be some functional

distortion of the stomach cells because there is a problem with the circulation. So, one observes that the blood or the lymphatic liquid stops on the venous stasis and the blood flow in the veins stops.

One of the best pharmaceuticals in this case would be digitalis; however, one has to take it in a form that's still acceptable for the stomach. Apart from the digitalis, one should always receive high doses of hydrochloric acid and Pepsin Hydrochloric Acid.

Primary heart and blood vessel diseases can lead to embolism or similar processes in the stomach arteries because of heart problems that are related to the inside of the heart or due to the material that is getting stuck inside the arteries.

But the understanding of the cause that leads to the creation of those erosions and how significant that is when it comes to two special blood vessels is not clear and people have different opinions about it. *Die Art. Lienalis, coronar, inf. Sinistr.*, an artery of the stomach on the left-end side is, according to Rokitansky, number 3 in terms of significance in the artery system.

When we look at the progression or how these diseases behave or how we observe them, very often we can observe chronically returning bleedings of the stomach and bowels, also involving the bowel arteries and this looks like an angina of the abdomen. In particular, when the patient has a large meal or when they consume high quantities of food that creates a lot of gas which will be a heavy burden on the blood system, we can observe an attack similar to an angina. A gastroenterologist can actually have a hard time discerning what the real cause of this attack is.

Hence, any diagnosis in general will be rather vague and it will very often involve the age of the patient and it will also be based on other deviations that the doctor will see in the patients; in particular, patients that are 40 years old and older will be diagnosed with this angina. This is rather important, especially if one can exclude cancer and cirrhosis of the liver. To make proper diagnoses, you have to think about this embolism, the heavy pain, the collapsing patient, you have to prove that there's blood in their vomit or feces and you have to include the observation of how the patient reacts to settling down and not being too active and there should be a milk curer. Hence, there's not only the milk treatment but also the pharmaceuticals that help you excrete more urine.

In particular in older patients, it is important to observe the material that is sticking to the blood vessels. So, with elder patients these processes are important to understand how stomach ulcer is developing. For younger patients, this is actually less significant. So, one can observe a lack of secretions from the stomach or from the pancreas.

Another aspect that comes with age is the apparition of *Achylie*, and one of

the causes of this *Achylie* could be the blood vessels that are being blocked or that are getting smaller or less flexible. Hence, this is also the case of a stomach disease where actually the stomach isn't the problem, but there actually is a problem of the blood vessels. The reason for Angina pectoris can either be a real coronary sclerosis or the Angina based on nicotine.

Although it is actually a blood vessel problem, those patients also tend to seek assistance from a stomach specialist. However, to make a differential diagnosis, to distinguish this problem from some kind of pseudo Angina, you have to watch how the patient is walking because it is very important to understand what the root cause of the problems actually is, whether it is a real Angina or not, in order to choose the correct form of therapy. If you have a patient that has the false Angina symptoms, in the case of an empty stomach they will manifest in general during the morning or before breakfast, and also before lunchtime and the patient can walk without experimenting the feeling of too much gas or pressure in his stomach. But if after lunch or after having consumed a large amount of food, the patient has severe problems and they experience pain especially behind the sternum and the pain is so intense that the patient is forced to stop walking, in this case the diagnosis should be simple.

Another case would be when the patient starts to walk and in the beginning they experience an uncomfortable sensation behind or underneath the sternum but when they continue walking this sensation goes away. Then, we cannot be sure whether it is a real Angina. We know that in certain cases patients that are still in the beginning phase of a coronary sclerosis, after having conquered the initial attacks, they are even able to walk for miles and miles without an immediate reoccurrence of these attacks. That is why whenever in doubt, one should always act as if it were as if it were a real Angina.

However, as every real medical practitioner knows, in the case of an Angina it is important to make sure that you are also treating the stomach to alleviate or to take some pressure away from the heart. And this is a very important part of the therapy. I will not write about the usual treatment of the Angina pectoris here, and I am just referring you to the later description of passive gymnastics included in the therapy of a coronary sclerosis.

Very often, stomach problems show a form of hypo secretion. This occurs because we very often encounter people that love to eat too much, people that smoke or drink and that also have a chronic gastritis side next to this arteriosclerosis; this is not an ulcer, but an inflammation of the stomach. Hence, hypo secretion means that too little is being secreted. Very often, larger doses of pepsin hypochlorite acid in combination with salty water will be beneficial for the patients, because this is basically like mimicking whatever is usually in a healthy stomach.

On the other hand, very often the Angina pectoris attacks can be alleviated when the patient drinks effervescent powder which will make the patient burp.

This can be one way of stopping Angina pectoris attacks or maybe reducing them. Or it can be helpful if one introduces a tube into the stomach, from the mouth into the stomach of the patient and thus helps the patient to get rid of the gases. It is important to regulate the diet but not in the sense of the currently, popular and just very schematically used lacto-vegetable and tight arteriosclerotic diet or even raw food or raw vegetable diet, because this type of diet leads to burps or flatulencies.

In that case, one should have small snacks frequently and drink little. In the evening, especially if one has problems in the evening, one should have very small portions, very small snacks and something that is easy to digest, something like porridge or cold meat.

The treatment of the stomach problem not only has a physical, but also has a psychological impact on these patients because they are living in constant fear of another attack and if we can reduce the symptoms we can already lead to an alleviation of the problem. The treatment of the stomach problem is acting like a psychological deterrent for the patient; it doesn't only cure the cause but it's also alleviating the problem and is increasing the quality of life.

So far, we have been talking about the adverse influence of the sick heart on the stomach. Just like the adverse influence of the heart on the stomach, be it organic or just in terms of symptoms, the heart could also be affected by a sick stomach. A stomach disease or a disease of the digestive tract that is just a latent problem will only be seen through palpitation when we observe some functional problem of the heart or heart failure.

In general, when we have a healthy heart and we fill the stomach, we can even observe an increase of pulse and an increase of blood pressure; so when we actually consider an unhealthy or an unstable heart it is quite easy to understand that the influence will be even stronger. It is impossible to list everything, all the symptoms and all the diseases that can be observed or diagnosed. And all those problems have their actual root cause in the visceral neuropathy. It is important to observe that it is not the heavy disease like ulcer or cancer that will have a severe impact on the heart, but is in fact only a latent or weak disease of the stomach that will have an impact on the heart.

So far we have been talking about the influence of the sick heart on the stomach. However, it is quite natural to assume and we concede in numerous instances that the other way around also exists, namely the influence on the heart created by a sick stomach. Mr. Huhartz is even assuming that the existence of a latent stomach disease will only be recognized through the existence of some heart failure or problems of a functional heart.

Upon filling the stomach we can see an increase in pulse and in blood pressure in the case of a healthy heart. Therefore, the sick heart will obviously be influenced much more, compared to the non-problematic heart. It is impossible to list up everything, all the various kind of neuropathological diseases or

observations or diagnosis that we can never come across, like heart vagus nerves neurosis, digestive reflex neurosis to name just a few.

The really heavy stomach's illnesses like ulcer or cancer are not showing the strongest influence on the heart, but in fact we see a stronger influence of the lighter diseases. It appears that it is actually the softer, the more subtle impulse that has the stronger impact rather than the less subtle impulse. When we look at all those different processes, we observe that the correlations between the stomach and the heart have chemical toxic root causes in most cases. We very often observe an arrhythmia of the heart due to stomach problems, very often with children and with nervous or unstable adults. Palpitations of the heart can either be subjectively recognized by the patients or can be heard and in most cases they are objectively recognizable after meals, but also very early in the morning, without having eaten anything; however, the latter subside very often after having eaten a bit.

All those problems with the arrhythmia can be observed with neurasthenics, but also with arteriosclerotic patients.

Tachycardia is very often accompanied by acidity. Tachycardia can easily be treated with some local treatment or a more general treatment. Tachycardia can either come in the form of a general increased pulse or short bursts where the patient exhibits very, very high pulse rates and it is very often accompanied by acidity and resulting stomach and intestinal problems.

Bradycardia, accompanied by additional heartbeats is very often created or stopping in the stomach, in particular with hyper acidic, diatonic patients and it can lead very often to misdiagnosis...To name just a few: myocarditis, Adam-Stokes attack or even a tumor of the brain. But when we find an acidic patient, Mr. Schmidt in Prag pointed out that very often this patient will have a hypotonic bradycardia.

When we apply a pharmaceutical that will trigger vomiting or when we clean the stomach, rather critically looking diagnosis can disappear. Very often, we see idiosyncrasies of the stomach, sometimes accompanied by anaphylactic diarrhea, where these idiosyncrasies create very characteristic heart problems or heart failures. Sometimes one can observe that particular food or particular dishes can create these heart problems for some people and sometimes the patient doesn't even know that there is a correlation between the particular food and the heart problem.

There is a very old theory that assumed that when the stomach is filled, it will push up the diaphragm and hence exert pressure on the heart. But now, since we have x-rays, we can actually prove that this old theory is true.

If we look at the stomach's bladder and its bladder is expanding, be it either because of gas or because the person has eaten a lot, then we can actually

observe that the diaphragm is being pushed up and on the left-hand side we can see due to the dilation of the stomach and the diaphragm is being pushed up and it remains in this pushed up position. If the dilation of the stomach is not just a temporary one, but it is rather due to problems of the stomach, it is more or less permanent. This pathological elevated diaphragm now leads to a purely mechanical limitation of the space available for the motion of the heart and just because of the mechanical aspect it can lead to atrophy of the diaphragm.

X-ray specialists, radiologists, are talking about the pneumatosis of the stomach and in 1912 I have already described those mechanical interrelations between the heart and the stomach and I have described them from a diagnostic and therapeutic point of view and identified them as critical and I introduced the term gastro cardio complex into the literature. The reason why I could do so was because when I was working in a sanatorium, I could very often see a tent of this type of patients that were having those problems and Mr. Berg of the Bergmannchen clinic has also described this rather to the point when he wrote "A small group of senior patients and middle-aged patients are visiting the doctor because of problems that seem to indicate that there is a heart problem; however, the problems only occur right after the intake of food or drink or those problems are being aggravated by the ingestion of food or drink. These patients are complaining about a feeling of pressure, obstruction or some other kind of pain in the vicinity of the heart, sometimes leading to rays of pain that are extending into the left arm. They are talking about strong heartbeats, problems with breathing, tachycardia and heart skipping, particularly during or shortly after having eaten large meals like lunch, breakfast or dinner. It is interesting to see that these patients very often are actually reporting that their problems become more severe or change, not depending on the type of food that they consume, but rather depending on the amount of food that they consume. However, very often these patients have bigger problems with food that is creating a lot of gas. These groups of patients have already been described by Mr. Roemheld, who introduced the term gastro cardio complex into the literature."

According to my own experience, this type of patient actually is not so common when we are considering simple workers or normal patients, but this type of problems are more often observed with private patients and wealthier individuals. This can be due to the different lifestyle, in particular relating to the work that they are doing, the motions that they have to go through every day but it can also be related to other constitutional factors, but most of all it should be due to the eating habits and to the types of food that those two groups are consuming.

It has not been my intention to create a new kind of disease. I was much more aiming to create a short and simple text that summarizes all those different interrelations between the different organs and all those different types of diseases or symptoms that patients are experiencing. I myself have never understood this gastro cardio symptom complex as a disease in its own. I was more interested in coining a particular, a fitting term and I understand this as a term that describes the combination of different problems; it is not one particular



disease.

For me, the heart and the blood vessel system were just an indicator, which the non-specialist Dr. Kan can use to deduce what is happening inside the body of the patient.

I noticed rather early that not every heart has a problem with the elevated diaphragm and we can see that this is true even now. I am looking at two tuberculosis patients. It is not the case that every heart has a problem with an elevated diaphragm. One can even prove that experimentally when you introduce a lot of CO<sub>2</sub> into the stomach of young and healthy persons who do not have any kind of heart problem with heart failure. For some patients we do not see any problem at all. Others will very clearly express uncomfortable sensations and problems in the area of the heart, but the reason for that might simply be that the threshold of the nervous system has not been exceeded in some cases, whereas for the other patients that actually feel something, they have an abnormally low threshold and they will experience the sensation.

The gastro cardio symptom complex is actually requiring that we have a patient with a heart problem that is reacting already to very small changes in the stomach. So the high sensitivity is its crucial component for this complex. This is the neurological part of this complex of symptoms and this description is still through today.

It is not clear whether the root cause of this complex is based on a problem of the individual organ or a problem of the nervous system, or if there are actually exogenic root causes like coffee, nicotine, or psychological, psychosomatic causes or whether there are antigenic causes like the genitals, the thyroid could also be another root cause for this problem or whether there are some toxins that are related to this problem; so in general the root cause is not clear. And hence, to clearly identify the causes of the heart problems, this has to be investigated case-by-case, individually, in great detail. I'm summarizing my observations. I called them the gastro cardio symptom complex and I'm not really looking into one particular root cause, be it like gas or food or whatever, I'm just considering problems of the heart and of the stomach that are correlated to each other and where the root cause can be very, very different in each case, either from the stomach or from the heart or a combination coming from inside the body or from outside of the body.

An additional precondition or ingredient for this gastro cardio problem is an intra-abdominal affection, some kind of change inside the abdomen which results in the elevated position of the diaphragm. In most cases, this root cause should be dilated stomach; that involves the creation of an air bubble in the upper part of the stomach, which is located underneath the diaphragm. So this stomach bubble will usually be located on the left-hand side, below the diaphragm, and it's a gas bubble and it usually results from other organic or functional failures which can have their root cause for example in the swallowing of air, in some intake of

air or in the ingestion of food that creates a lot of gas.

Another candidate for a root cause would be a bubble on the left hand side of the colon.

Everything that increases the contents of the stomach, especially while standing, will lead to a feeling of constriction, in particular because the colon is rising due to the gas, and hence the diaphragm will be pushed up and this feeling of constriction will normally lead to a feeling of constriction of the thorax, but also of the heart.

Some particular examples of that are the abdominal tumors, cancers, pregnancy, an excessive amount of fat or meteorism and we find that already in diseases related to the stomach or to the bowels. When it comes to the genders, males in general are more often confronted with a unusually high location of the diaphragm, more common than women are and that may be due to the fact that the women's muscle tonus is not so high, hence the muscles or in general the muscle tonus in the abdomen of females will lead to a larger flexibility of the diaphragm and hence the diaphragm will have the option to evade the rising colon.

But the other reason for the fewer cases observed with women is simply because they eat less and they eat differently.

As a result of the enormous gas pressure in the stomach or in the abdomen, predominantly in the epigastrium, one finds capillary inflammation along the coastal arch. I could diagnose such a problem about 20 times as often for men, compared to women. The gastric cardia symptom complex is composed as we saw previously, of a nervous component and an abnormally sensitive heart and a collection of air on the left-hand side, underneath the ribs or slightly below the heart, above the stomach. The whole complex, the nervous part, this oversensitive heart, that air pocket will lead to the feeling of constriction in the area of the heart. These components and the resulting sensation, this is what constitutes the gastric cardia symptom complex.

Apart from this dominant mechanical influence, there are also visceral reflective influences on the heart due to chemicals or toxins or influences based on hormones or any other correlations with the colon and the entire bowel system; they all influence the heart and may lead to deviations in the action of the heart. However, since our knowledge about all those correlations is still rather limited, I'm just naming them here and I will continue in the subsequent pages and paragraphs with the influence on the mechanical restriction only.

Gastric cardia problems occur during all stages of the life span of a human being; however, we find them in particular with middle-aged and aged patients, predominantly men. During the years when the cartilage of the thorax and in particular the cartilage of the ribs calcifies and the thorax is getting more and more

rigid, all those deviations will lead to more problems with those patients. The sensations will be more pronounced. Patients who are suffering from the gastric cardia symptom complex in general don't give the impression of being critically ill. They don't feel quite well, as they say, and they are always complaining about some pressure on the left-hand side.

They meander from one doctor to the other and they finally end up with somebody who claims he found the silver bullet. So for now let's first look at patients who are suffering from the gastric cardia symptom complex but who actually have a healthy heart. Because as we know and as I have written a few paragraphs before and as one can demonstrate with healthy patients whose stomach is being pumped, we already know that even organically healthy hearts are adversely affected with an abnormal elevated diaphragm and in opposition to Mr. Schur, I would like to point out that this can be proven and I have proven it and I've written about this just a few paragraphs before, when I mentioned the experiments with patients whose stomach was pumped on purpose and otherwise these patients had healthy hearts.

Let's start with the description of the classical gastric cardia symptom complex, as I already described in 1912, but I would like to point out that more often we will find slightly rudimentary cases where the symptoms are not so critical and where actually we cannot diagnose all of those components that I mentioned above. However, these cases are actually the most important ones for the general physician.

But to everybody who is familiar with the classical gastric cardia symptom complex and who knows all those images, especially the ones we encountered due to vegetarian gas creating food during the war, and we observed that rather often, all those physicians will have an immediate reaction of first seeking out the position to clarify the function of the stomach and the location of the diaphragm, apart from checking the proper functioning of the heart; and if they do so they will be able to diagnose even the less critical cases properly and to treat them properly as well.

Subjectively old patients are complaining about a feeling, a sensation of pressure in the area of the ribs arch, on the left-hand side, which is increasing after meals, and this sensation of pressure is shifting more towards the stomach or the bowels. But it will also generally become stronger and you will also be feeling rays of pain that are extending even into the left-hand arm. So some people would describe the whole complex as somehow similar to angina pectoris, also because people are describing sensations of pressure underneath the sternum, and this is something that is not very common, if we were talking about elevated diaphragm only.

In particular food that leads to flatulence, although it's very difficult to say which food that is, because every organism and every patient is different, hence it's very difficult to deduce some rules. However, this type of food will always lead

to pressure on the left-hand side, around the ribs' arch. Mostly these patients cannot properly cope with carbohydrates and cellulose in large amounts. These patients also describe a sensation of not being able to catch their breath.

Patients suffering from this problem have actually un-learned to breathe deeply properly, un-using their diaphragm, because the diaphragm is in an abnormal position. They have the impression that they cannot breathe deeply, it's like a blockage, as Mr. Hertz describes this status...hence these patients, because of this problem, have this very strong sensation of limitation or constriction.

Due to a stimulation of the vagus nerve created by this pneumatosis of the stomach, we observe bradycardia and extra-systoles and the patients notice it very strongly because they can actually hear it when they are lying down and because people are hypersensitive. Also the opposite, tachycardia, due to interpolated extra-systoles are rather common. Every now and then, I could also observe in the case of an organic sick heart where the stomach is triggering an actual arrhythmia; and one could cure that arrhythmia when curing the stomach.

A former employee of mine, Marg. Kleemann, has reported those cases. On one hand side we see an offset or a zigzag of the cardia and on the other side we see a zigzag of other large blood vessels in the thorax as well, and thus we have patients with dizziness, fainting, and other secondary sensations like angst or fear of death, some sort of neuroses that can lead to stomach pain, the urge to vomit, continuous burping, and in general a patient who is having problems very similar to a so-called Adams-Stokes symptom complex, in particular when these problems are aggravated with a strong bradycardia.

But one has to point out that all those problems are actually created or originating from the stomach and not from the heart and we see that simply because in those cases the proper treatment of the stomach reduced all those problems that were believed to actually originate from the heart. Very often, lying down on the left-hand side will facilitate the expulsion of gases that can leave the colon or the stomach through the esophagus, which will already improve the status of the patient.

In a similar fashion, laxative pharmaceuticals or pharmaceuticals that will urge the patient to vomit or some kind of gastric lavage may improve the symptoms of the patients; and in particular the therapeutic effectiveness of those pharmaceuticals and the gas reduction in the stomach may lead to an improvement of the patient's situation. This is proof that the elevation of the diaphragm in particular on the left-hand side is the root cause of this problem. Almost all those patients are actually convinced that they have a heart problem, because they continuously experience the sensation of pressure underneath the apex of the heart, and because they continuously experience all those different sensations that more or less focus on the area of the heart, not on the stomach.

However, one could add, in all those cases when the heart is actually functioning well, the symptoms are subsiding when patients are physically active. I myself know some patients who can do extended ski tours, ski trips, but when they eat a fresh bun in the morning, for breakfast, they suffer severe attacks.

Two years ago, Mr. Schlayer in Müncher Medizinischen Wochenschrift, has described such patients who at the first glance gave the impression of a true angina pectoris, but actually all those patients solved those problems and the attacks, the angina pectoris look-alike attacks subsided when they switched their eating habits and opted for a different type of breakfast.

Characteristic for all those patients is that when they are changing their position rapidly, in particular when they are lying down rather quickly, one observes a strong extra systoles, in particular when this change of position happens shortly after a meal. This observation goes away after burping.

What do we actually find when looking at those patients with the gastric cardia symptom complex and the healthy heart? Well, in general, after fasting or in a state of fasting everything is normal, and the electrocardiogram will actually look somewhat different.

However, after a meal one observes that the ictus has moved up and to the outer side, sometimes even above the left-hand mammilla. In particular on the left-hand side, below the clavicle, due to the upward motion of the heart, which results in a limitation of space for the left-end side of the lung, and hence the change in the sound. If one listens carefully, all the patients actually should exhibit this problem. If you listen carefully, you should find it with all patients...usually everybody that suffers from this complex, the gastric cardia symptom complex should actually have that problem.

During auscultation with the stethoscope one can hear some unclear sound at the apex; very often it's a systolic sound and it is created because of the shift in position. The second basis tones are loud and clear, sometimes with a metallic resonance and this resonance is due to the increased size of the bladder of the stomach; because sometimes the stomach will not only go up in front of the heart, but also very often behind the heart.

In particular, the larger blood vessels are pushed towards the front of the thorax. For all those patients, one observes an increase of blood pressure, which might be due to a nervous heart, but to some extent it could also be due to the abnormal gas pressure inside the abdomen.

The best way to clarify or to diagnose this problem is to do an x-ray. Very often, patients that are suffering from this problem already for long time, these patients already have an increased size of the stomach while fasting. After a meal, in particular after lunch, one may observe an excessive amount of air, large air pockets, underneath the left-hand side of the diaphragm and this air pocket is

lifting the apex of the heart upwards, which in general will lead not only to a dislocation, but also to a rotation of the heart and the aorta will shift its position from the lower left to the upper right as well. Thus, one gets the impression that the aorta is actually leaning forward and it is easy to be misled by this impression and diagnose something like aortosclerosis. In general, the overall image very much mimics something that looks like aortosclerosis. That is a shift to the side, a seemingly increased size of the hearts, modified configuration of the aorta and a moving forward of the aorta towards the right.

In the case of a true sclerosis, one should actually see, when taking an x-ray from the side, something like an uplift of the aorta. It should bulge. But in the case of a gastric cardia symptom complex, you shouldn't see that. You should see the difference. While breathing, one very quickly remarks that all those patients are breathing as flat, as costal, it's just like from the lung, not from the stomach and just with the upper part of the thorax.

One effect is all related to the elevated diaphragm and the lack of ability to properly breathe through the diaphragm. The heart is being pushed up by the diaphragm, the left-hand side of the lung is being compressed, more or less, the clavicle on the left-hand side looks different from the right-hand side and it's just like bulging. In general, the physicians are misled to diagnose that as a chronic obstructive pulmonary disease. This is how people misdiagnose it.

However, in describing the gastric cardia symptom complex, our description would not be complete unless we properly describe the various dyspeptic problems that may lead to the abnormal aggregation of gas underneath the left-hand side of the diaphragm. Those are the actual root cause of this problem and together with the over sensitiveness of the heart, they are actually the root cause of the heart problems. Very often I observed patients who had no or too little acid in their intestines.

As we all know, an un-acidic stomach is hyper motile; in biology, motility is the ability to move spontaneously and actively, consuming energy in the process. So it is like the stomach moves around a lot...excessive bowel movements. Inside the hyper mobile stomach, due to fermentation we see an accumulation of gases and this is the reason why the stomach bladder has an increased size, in particular with a stomach that is sub-acidic.

The sub-acidic problem and the increased size of the stomach, this is not said to preclude that for super-acidic problems, we also know about heart problems and heart failures which are related to the super-acidic status of the stomach, in particular due to their diatonic nature. People think they have a heart problem, where in fact they actually have heartburn.

So the sub or un-acidic stomach is well known to be hyper motile. It is an active or hyperactive neighbor for the heart. Inside it, a lot of them gas pockets are

created due to its functioning or due to gastric processes, also due to fermentation processes and that is the reason why the stomach bladder reaches its abnormal size in a sub-acidic status.

In saying so, this shall not preclude that a super acidic stomach will preclude heart problems, especially of a vagotonic nature. They still may occur. But, when looking into the super acidic cases, I myself discovered much fewer gas pockets or exaggerated stomach bladders compared to the sub acidic case. Heart problems are actually not very common in the case of ulcer or cancer. However, Mr. Berg recently described such cases too. Somewhat more often was I able to diagnose angina-like situations or states in the case of gallbladder diseases. However, they always completely disappeared after a gallbladder operation. In this case, the differential diagnosis can be rather difficult. Interestingly, Mr. Rosenfeld in Stuttgart mentioned some cases where patients were complaining for years about severe gastric cardia problems, but all those problems completely disappeared when those patients in fact developed a stomach cancer.

Considering all the different illnesses of the colon, which might be a root cause for the gastric cardia symptom complex, in particular this fermentation dyspepsia or colitis, in particular a colitis of the left flexor, those are good candidates for a root cause. Other root causes might also be chronic colon atony

The chronic form of colon atony, accompanied by obstipation, spasms of the colon, accompanied or accompanying a catarrh and other adhesive processes in the left upper part of the abdomen...Mr. Payr has described such cases as stenosis.

Quite obviously, psychological processes also play a major role in the buildup, in the creation of the gastric cardia complex. Very often, I myself found the gastric cardia complex in patients with depressions, and all those symptoms disappeared when the depression went away. Regarding the swallowing of air which up and until today still has not been properly understood, my work conquers with Hitzenberger's, who is pointing out that the problem is not actually the intake of air, but rather the failure to get rid of this superfluous air which is creating the pneumatosis of the stomach.

Obviously, we will find the gastric cardia complex or some thing that looks like it if the heart is actually sick, not only with the healthy heart. Actually, I think that when the heart really has a problem, the symptoms are actually more impressive and as a doctor, one is much more drawn towards treating the digestive system rather than the heart. If a healthy heart already creates problems due to the mechanical constipation which are rooted in the air pockets which lead to the patient's sensation of an obstruction, then these sensations will be experienced much more strongly and the heart failure will be much more pronounced when considering an actually unhealthy heart. However, as usual, one sees different shades of gray between those two extremes.

For example, an unhealthy heart that is more stable will not react so much on the elevated diaphragm of the patients and the patients will experience this constriction not so much; hence, we as doctors will see much more of the objective symptoms of the dislocation of the heart, it being pushed up, and the

resulting consequences on the entire circulation of the blood stream. It is quite obvious that the heart has to work much harder and has to push much more when it is displaced from its normal position. That is true for the healthy heart and that is even truer for the sick or the unhealthy heart. Either way, even in the case of an unhealthy heart, of a heart problem, one should never forget to also look at potential problems which might arise from the digestive system.

However, one should never be satisfied with the diagnosis of a gastric cardia symptom complex alone. In all cases, one must also investigate the health status of the heart, whether it is healthy or whether it is a case of an organically sick heart whose situation is aggravated by stress coming from the abdomen. The differential diagnosis, whether we have an angina resulting from an elevated diaphragm or whether we really have an unhealthy heart, be it due to a coronary sclerosis or heart failure, this differential diagnosis is part of the responsibility of a good doctor, as it results in different therapeutic avenues.

The second step of the diagnostic process is however to diagnose the exact stomach or colon problem that might stress the heart, and it is important to include the psyche of the patient. Only a combination of physical, chemical and radiological tests can prevent perils. In many cases, this will even be possible without an x-ray apparatus, just by classically looking at the interaction between the two organ systems and by doing proper examinations and anamnesis.

A prognosis of the gastric cardia symptom complex is based on a prognosis of the underlying root cause, and also found in the prognosis for the heart and the blood circulation system. In general, in the case of a healthy heart, the prognosis will be good if the gastric cardia symptom complex is diagnosed early.

In opposition to Mr Hitzenberger, I think that this is a very special case of a disease where the physician can actually help his patients so much mentally and physically. But there's one thing one should not forget: the gastric cardia problems, in particular for middle-aged men, can be understood as a warning signal, which is why Kuckuck coined the phrase pre-angina. If they are not treated on time, then one may assume that on the long run these problems will result in hypotonia, in sclerosis and in the expansion of the thoracic splanchnic nerves. So there will be sclerosis in splanchnic nerves area, in particular sclerosis of the kidney. The heart might also be adversely affected due to the ongoing constriction, the shift of its position, which is making the situation for the heart worse on the long run. And that is why one may assume that the constricted heart will suffer from coronary sclerosis on the long run and the actual purely temporary state will fixate and will turn into the chronic state of heart failure.

The therapy of the gastric cardia problems must focus on finding the root cause for the air pockets below the diaphragm, in particular on the left-hand side, and the next step will be to get rid of these gases. In doing so, one will also be able to treat the adverse effects on the heart. There are three root causes for those air pockets: swallowing air. The root cause there might be stressed out persons, people that eat too much, too hastily and people that purposefully swallow air because they make it a habit to burp, as it helps them to rid them of a sensation of a filled stomach and a constriction sensation in the area of the heart.



The second root cause might be the insufficient reabsorbing of stomach and colon gases and the delay in emptying or draining them. Potential root causes might be an exaggerated tonus of the vagus or a stenosis in the area of the lower exit of the stomach. So any kind of deformations, in particular in the area of the left colon flexor...And the third root cause could be an abnormal creation of gases in the stomach or in the colon, due to fermentation processes, which again might have their root cause either in the food that the patient is ingesting or in an insufficient processing of the food through the digestive system of this patient.

That is why it is important to properly investigate and to treat the patient and to look in those three areas to properly understand the existence or the generation of exaggerated air pockets on the left-end side. It goes without saying that those three root causes do not only exist on their own, but any kind of combination is possible. And only once one has completed the proper investigation of the root causes, one can actually start the right therapy of the gastric cardia symptom complex. This therapy has to include the overall well-being of the patient and its psyche, the gastric system, the diaphragm and in the case of an unhealthy heart, the actual heart problems as well. These are the four components.

Now let's consider that we have a gastric cardia symptom complex with a healthy heart. Looking at the psychotherapy of the patient, of this type of patient, and depending on the ability and mentality of the doctor and his or her ability to meticulously diagnose and investigate the problems of the patient, there are generally two potential causes for error. Number one, these patients are considered as heart problem patients and they are treated in that way or they are actually not treated but the doctors are trying to console them and to send them away with the statement that they actually have no heart programs, that all their problems are rooted in their psyche. In either case, this approach is insufficient for patients suffering from the gastric cardia symptom complex.

The doctor who only treats the patients or who considers this type of patient as a heart patient is not familiar with the gastric cardia symptom complex, this doctor does not know this complex. The symptom complex may be diagnosed based on the modified position of the heart, it being seemingly enlarged, if the auscultation will show an unclear sound around the apex of the heart, the second basis tone has a rattling sound to it, and there are hypertension peaks which go along with this symptom complex; but then again, there are subjective heart problems that the patients are reporting and if one considers this complete picture of heart problems, then any doctor that is not familiar with this symptom complex may be misled to assume an actual heart problem.

And one should also say that usually the patients themselves are considering their heart as problematic and they consider themselves to be heart patients. The problem is that this is kind of an autosuggestion of a really severe disease of the heart and blood vessel system. They are fixated on it and it will get actually even worse if the doctor is leaning towards the same diagnosis. This can go as far as one simple and inconsiderate statement of the doctor, leading to a severe depression on the side of the patient. That is why it is also wrong to send these patients to rehabilitation centers which are focusing on heart problems,

because these centers will give them digitalis and iodine, they will have to lay down a lot and they will have to ingest a lot of vegetarian food. Not only will these patients tend even more to consider themselves as inefficient or as incapable, but they also are moving much less than they should and the lack of motion will actually not help them to get rid of excessive gases.

On the other hand if we already have patients that are actually un-acidic and eat a lot, because they don't move enough and because they eat too much, they will be getting thicker and thicker and in the long run they will tend to unlearn a proper breathing technique, which will result in an aggravation of the symptoms, namely the feeling of constriction in the area of the heart and the thorax region, in particular on the left-end side. Since the symptoms are being alleviated by burping, these patients tend to swallow air on purpose more and more.

In the end, we will see a vicious circle from which the patient on his own cannot free himself or herself, unless the doctor makes the proper diagnosis and helps the patient to break this vicious cycle. However, it is also wrong to treat these patients only as nervous or hysterical, even if one might be misled to treat them due to their habitual swallowing of air. In almost all the patients, next to the obvious psychological problems, one can actually see real physical symptoms, objectively measurable changes in the gastric tract, problems in secretion or the motor system of the gastric tract, chronic gastritis or something that looks like gastritis with other secondary irritations of the colon, abnormal fermentation processes, spastic estates, an over-expansion of the colon and the stomach or other more severe organic modifications, as Burg has already proven.

If a physician only treats these patients based on their nervous or psychological problems, they will rightly feel misunderstood, they will wander from doctor to doctor and since the problems will not go away on their own, presumably they will end up with a quack doctor. However, one has to admit that psychotherapy can actually be triumphant in the case of patients with the gastric cardia symptom complex who do not suffer from heart failure. In my opinion, one has to try two-pronged approach: on one side one has to point out to them that their heart actually is capable and one has to point out to them that the proper treatment of the underlying gastric problems will help them. And already these diversions, away from the heart, towards the stomach and the gastric system will be very comforting for these patients, as I already pointed out during a 1927 Congress in Wiesbaden.

Most of all, one has to train the patients to breathe properly and to quit swallowing air. It is also important that one has to consider the diet of the patient and ensure that they return to an average, normal weight; this is particularly significant because most of these patients are slightly fat people.

The second important step of the therapy has to include the complete digestive tract, which is presumably the actual underlying root cause of the gastric cardia symptom complex. If we were trying to be more complete, we would have to discuss the entire pathology of the stomach and the colon. However, I will only focus on a few points. In each case the diagnosis of the underlying gastric problems has to be done with utmost thoroughness. This also holds true for the

psychological components and causes of the gastric problems.

After a diagnosis, one has to look at the lifestyle of the patients, in particular at their eating habits. One has to tackle all forms of overeating, fast eating and one should motivate the patient to establish a regular eating pattern or habit. The aforementioned is often encountered, so sub-acidic and un-acidic patients will be positively affected by a high dosage of pepsin HCl. Every now and then, an irrigation of the stomach can also be beneficial. This is particularly true for patients with atonic gastritis. A former assistant of mine, Mrs. Kleemann, could prove in an X-ray study that high doses of pepsin hydrochloric acid would reduce the hyper motility of the sub-acidic stomach, which would mean a reduction of the hyper motility or agitation in the vicinity of the heart.

When it comes to diet, one has to consider the entire chemistry of the stomach. In general, I ask my patients who are suffering from the gastric cardia symptom complex that they cease to eat any gas producing foods. They all contain large amounts of celluloses; that means beans, cabbage, sauerkraut, fresh buns, freshly baked bread and fruits in large amounts.

One should also mention that the patients have to also reduce their intake of liquids in too large amounts. This might also includes days where they should refrain from drinking at all. It is well known that un-acidic patients in general cannot properly digest milk, while buttermilk and yogurt do not pose any problems to them. Carbonated water is strictly forbidden for all these patients. But in general every physician has to consider their personal experience and bear in mind the patient and their specific wishes when it comes to eating. However, any form of overeating has to be prohibited. In the case of super-acidity, my methods of choice are Neutralon, Palliacol, Kohle.

To facilitate belching, I would recommend Validol or Bornival. When it comes to fermentation dyspepsia, one should consider anti-fermentation food. Other candidates would be Allisatin, Mutaflor, Intestinol. It is astonishing to see how after years of misdiagnosed fermentation dyspepsia, the chronicle heart problems which are created through the gastrointestinal effects, these heart problems are reduced or disappear and the hyperthonia is vanishing as soon as the patients pick up a meat heavy diet, as opposed to the vegetarian and carbohydrate rich food that physicians usually prescribe or recommend due to their fear of arteriosclerosis or the general heart problems.

In the case of a catarrh of the large colon, a celluloses reduced diet is recommended in combination with flushing of the colon oil enemas. Very often, people suffering from the gastric cardia symptom complex do not like to lie down and rest after meals, while sitting or a no tempo walk or a game of billiard is working fine.

The third point that has to be addressed is the diaphragm. Anything that

increases circulation, in particular the venous run-off from the abdomen is something that improves the intra-abdominal tension created by the gas. And it will also improve the situation of the air pockets underneath the left-hand side of the diaphragm. This is why we prescribe massage sessions to our patients, hot baths, half full bathing sessions, abdominal compresses during nighttime, gymnastics, rowing and hiking or mountaineering, which also show positive effects.

In particular for patients that haven't been doing sports for a very long time, one has to gently build up their training level and has to gently lead them towards more strenuous exercises. On top of that, one has to add an active diaphragm therapy; that means the systematic training of abdominal breathing. At the end of this treaty, you will find two images taken one after the other from the same healthy individual, a gentleman who was undergoing a weight reduction diet here at my institute. The first image is after an extreme inhalation or diaphragm supported inhalation, the other is right after an extreme expiration. Both images were taken while standing. When comparing the position of the diaphragm and the distance between the right diaphragm margin and the clavicular, if one also compares the width of the middle shadow of both images, then one can very clearly see the stretching and the subsequent compression of the suspension of the heart, in particular the large blood vessel.

For some human beings, we can actually observe 4 to 5 cm changes in the position of the shadow in the middle. What is the root cause for this change of width of the shadow in the case of an elevated diaphragm? Well for once, one cause may certainly be the rotation of the heart and the change of the entire framework or the blood vessels framework supporting the heart when the diaphragm is lowered. In that case, the rising and the folding aorta coincide more strongly and this is why the shadow in the middle has to become thinner. But the rotation itself cannot be the only root cause for the change of the diameter of this supporting framework or the supporting fiber.

Why is that so? Because when I tested it with dead bodies, I could see very clearly the elongation of the aorta ascendence and a rise of the tension of the aorta arch. The test went in the following way: before opening the abdomen, one has to remove the rib cage partly, while taking great care not to pierce the diaphragm; after that, I was using the opening in the rib cage to simulate the abdominal breathing by rhythmically pressing the heart and pulling it downwards, together with the diaphragm.

For us, and this is the only option how we can actually influence the aorta and the heart through abdominal respiration, and that will have the same effect as a massage of the blood vessels or a form of passive gymnastics. I have two x-ray images there of a healthy patient, and already with a healthy patient you can clearly see how the exaggerated abdominal respiration hugely affects the position and the form of the heart, simply because it's kind of stretched out or compressed.

So just like a masseuse, we'll compress or stretch muscles and do it either directly or through gymnastics, so just like that any motion of the diaphragm will have an impact on the aorta and the heart in the sense of passive gymnastics. For me, the best form or the best way of having some form of heart muscle and aorta gymnastics, abdominal respiration is best. Not only does it strengthen the diaphragm and the abdominal muscles, but it also reduces the amount of fat in the abdomen and it massages the liver in such a way that the entire venous runoff from the abdomen into the vena cava inferior will be greatly improved, which will also improve the resorption of gastric gases.

This abdominal respiration should be trained before meals, while lying down in your bed or in the evening and it has a direct impact and will extend your life span and from my point of view it is also the best way of preventing aorta sclerosis for patients that suffer from the gastric cardio symptom complex. We all know, from the beautiful anatomic investigations, Oberndorfer has proven that regular sports and the movement of the large blood vessels is the best way of preventing any form of calcification processes of the blood vessels. I would just like to mention that Oberndorfer has proven with the femoral artery, the large blood vessel of the thigh, recorded its calcifications in the thigh and in the lower leg, while the popliteal artery is usually free from any arteriosclerosis, due to the continuous passive motion it exhibits.

Patients that suffer from persistent problems in the area of the left-hand rib arch, in this case I found it helpful to enforce a one-sided breathing pattern in which I tried to switch off the right-hand side. To achieve this, the patient has to sit down on a chair, bow down and grab the right-hand leg of the chair with his right hand. In the same way, one asks the patient to raise their left arm to a large extent and only breathe with the left-hand side of their lungs.

What we have been discussing so far is the therapy for patients suffering from gastric cardia symptom complex and an unproblematic heart. For this type of patients, there is no need for any therapeutic intervention related to the heart. In fact, a heart therapy would have adverse effects on the psyche of the patients.

The situation is completely different regarding patients that in fact suffer from an organically sick heart. For these patients it is also important to treat their psychological problems, to diagnose and to treat their digestive tracts and to have them breathe and train them to breathe through abdominal respiration. Hence, we see and we must use the same principles we discussed so far but next to these three principles, one has to treat the heart in a proper way, in particular with exercises or with resting. This also includes blood vessel expanding pharmaceuticals like Theobromin, Nitriten, Digitalis, Strophantin and any kind of suitable balneotherapy. Balneotherapy is used for rehabilitation, to have the patients rest. Unfortunately, I find that in spa resorts that have a focus on heart diseases are still not very familiar with the gastro cardia interactions and this is not

treated or not considered properly.

From my point of view, a lot of patients would benefit not only from the spa treatments that they received which focus on the heart but they would also hugely benefit from any kind of treatment that positively affects their gastrointestinal apparatus. This is why I happily welcome that a colleague of mine, who lives in Bad Nauheim and who is a former assistant of mine, Dr. Kuckuck, that Dr. Kuckuck wrote a long article about the gastric cardia symptom complex that in a magazine called Medizinischen Klinik.

Allow me to add a few remarks about the survey of the gastric cardia symptom complex. Siebert has recently discussed the issue in number 419 of the of the Berliner Klinik magazine. In the case of a sick heart, the status of the heart and the diagnosis will be significant for the assessment of the patient's ability to work. On the other hand, for a patient with a healthy heart, this question will be predominantly answered when evaluating the root cause in the gastrointestinal system. However, in both cases I expect that the patients will have the full capability to work, but that has to be taken with a grain of salt when it comes to particular professions which can only be properly evaluated in this particular context.

The clinical significance of the interaction or the interrelation between the gastrointestinal system and the vascular system results from the frequency with which the gastric cardia symptom complex is being diagnosed. Von Romberg writes in his well-known book about heart diseases that he found 44 cases of patients with symptoms that correspond to the gastric cardia symptom complex from a total of 463 patients that came to him with heart problems.

Obviously it will be part of the experience of the physician where he draws the line and how he interprets the concept of this gastric cardia symptom complex. To me it is quite clear that the classic clear-cut cases are not as common as the rudimentary cases or the gray area cases, which one encounters quite often, actually even on a daily basis, as soon as one starts to look for them. When one gets used to the idea of the gastric cardia symptom complex and starts to look at the digestive apparatus of a heart patient in the same way as one investigates the urine or the blood, then one will be very surprised what a significant role the digestive tract plays for all patients that suffer from heart problems.

To be honest, for the family physician this is an area where one can achieve great improvements and even healing, without a huge apparatus and without a large amount of infrastructure. One just has to take the detour through the digestive tract to actually cure or improve functional or actual organic heart problems.

Since my initial reports about the gastric cardia symptom complex were

published in 1912, a few other authors have been looking into that topic and the term I initially coined has become a common phrase in the German medical literature. Next to the already mentioned treatises, I would also like to mention the following authors: Morawitz, Hoffmann, August Hoffmann, Fritz Rosenfeld, Knosp, Hecht. The term gastric cardia symptom complex can also be found in the foreign medical literature.

The syndrome that I described is, as I already said in the beginning, not a disease in itself; actually it does not even represent one particular disease. The word gastric cardia symptom complex is merely a characteristic short fitting term that describes a whole group of problem stricken patients and thus, for the regular physician, it becomes a diagnostic problem which they should study and it is part of a therapeutic program that is of high significance for all patients that have heart problems of all kinds.

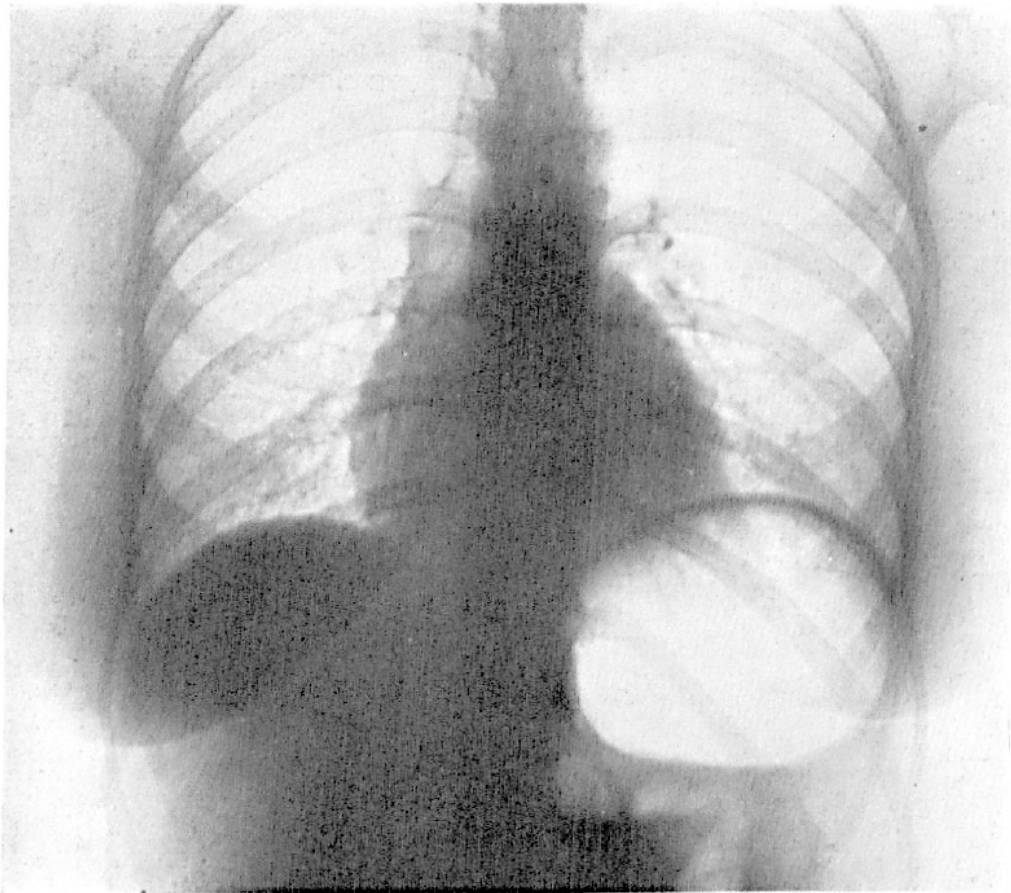


Abb. 1: Magenblase, gewöhnlicher gastro-kardialer Symptomenkomplex.

Figure 1, stomach bladder, normal gastric cardia symptom complex

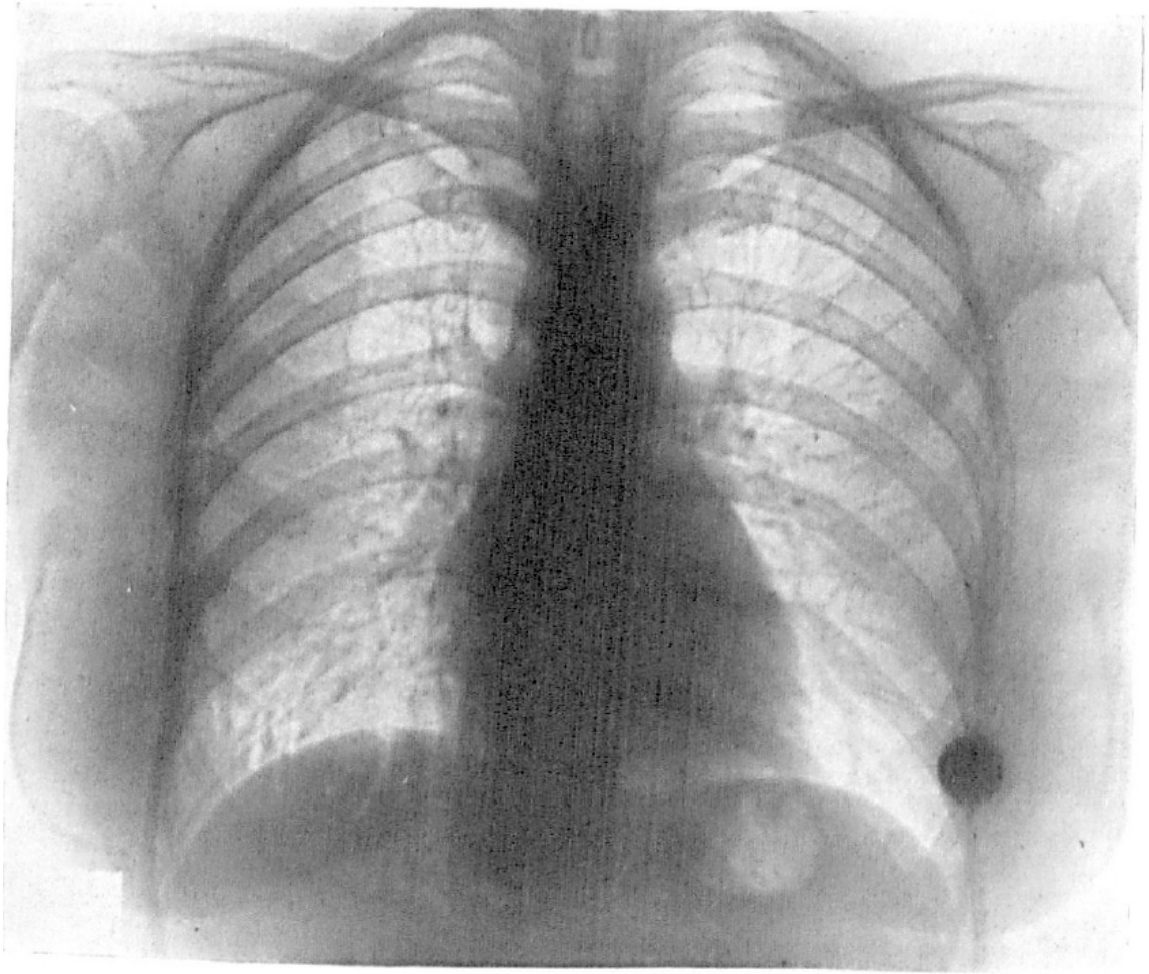


Abb. 2: Kleine Magenblase morgens in nüchternem Zustand.

Figure 2: small stomach in the morning before eating



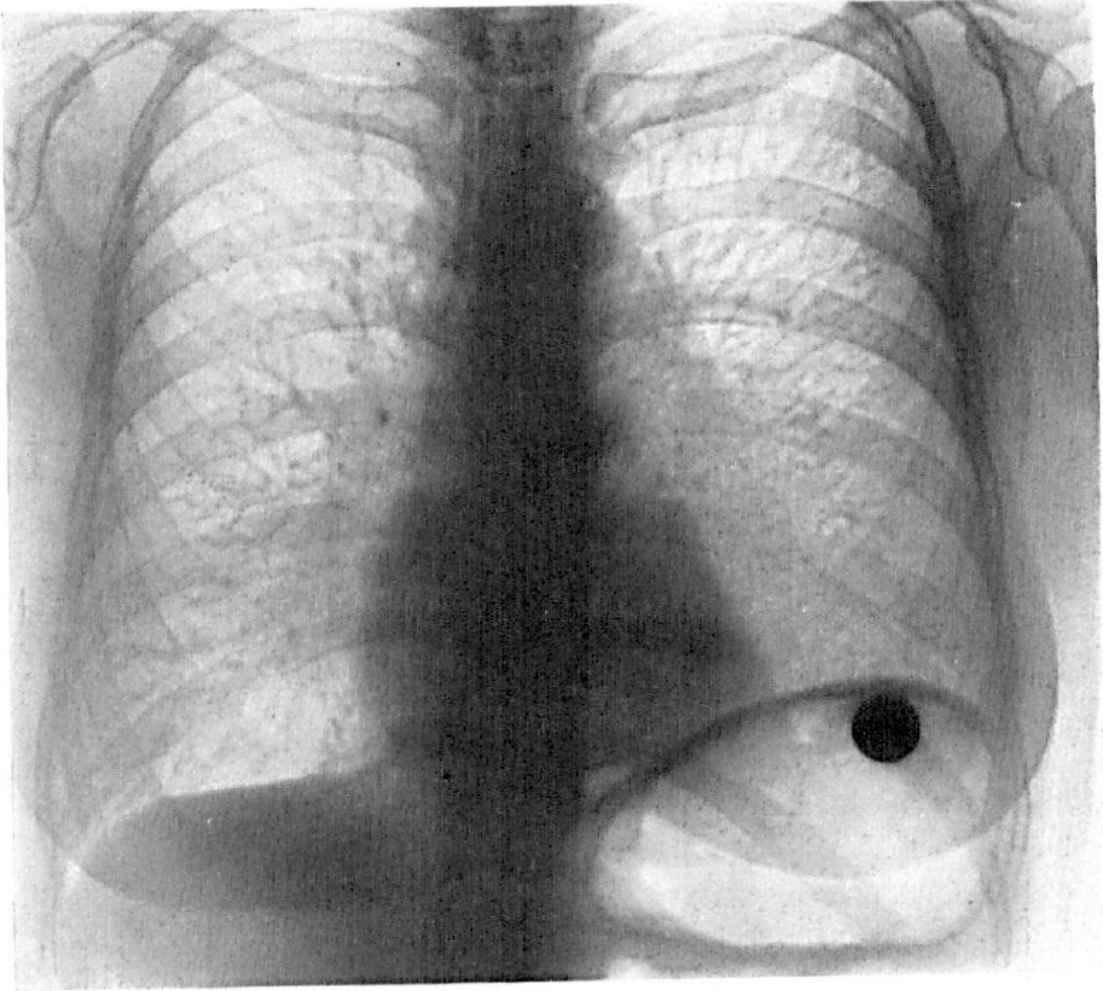


Abb. 3: Derselbe Patient wie Abb. 2 auf der Höhe der Verdauung.

Figure 3: the same patient as in figure 2 at the peak of digestion

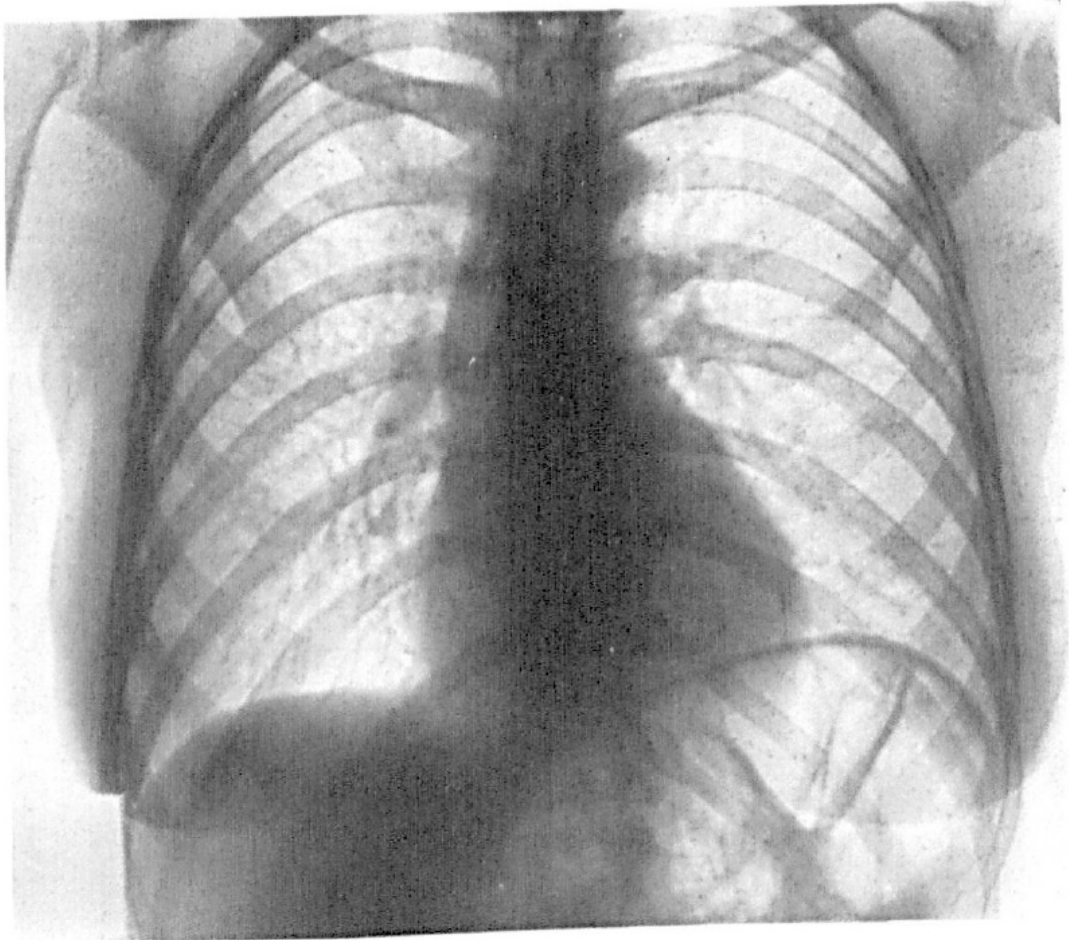


Abb. 4: Colon-Blase.

Figure 4: colon bubble, colon bladder

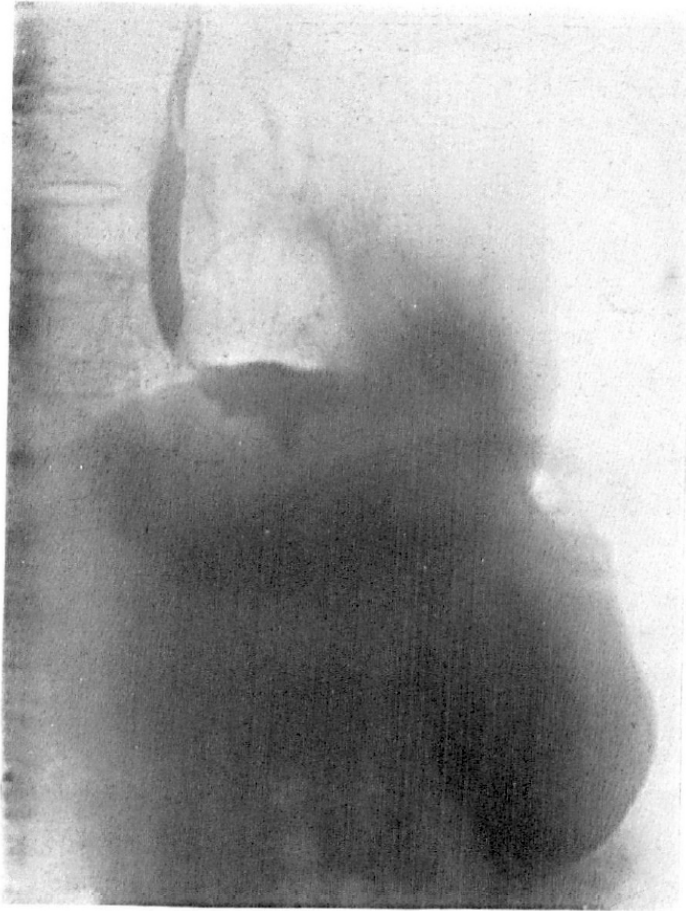


Abb. 5: Magenhernie des Hiatus ösophageus im schrägen Durchmesser aufgenommen.

Figure 5: the hiatus esophagus hernia of the stomach, taken with an angular inclination



Abb. 6: Magenhernie des Hiatus ösophageus dorso-ventral aufgenommen.

Figure 6: stomach hernia of the hiatus esophagus from a dorsal ventral point of view

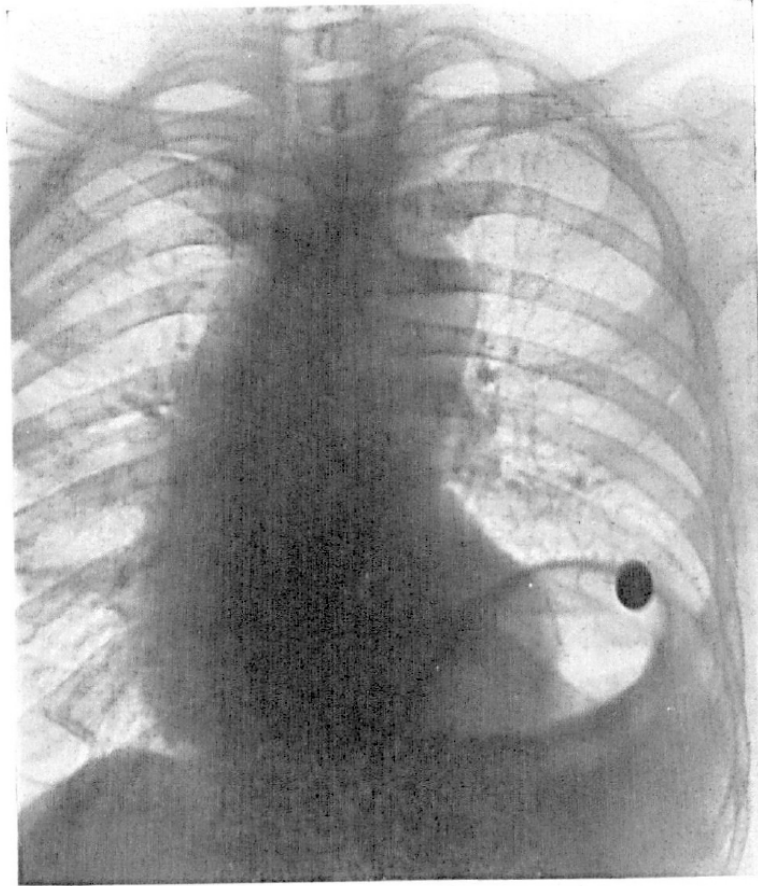


Abb. 7: Großes, aortenkonfiguriertes Herz mit breitem Mittelschatten und abnormem Zwerchfelldurchstand links bei Inspirationsstellung.

Figures 7: large aortic configured heart with a broad middle shadow and abnormally elevated diaphragm on the left-end side, after inhalation.

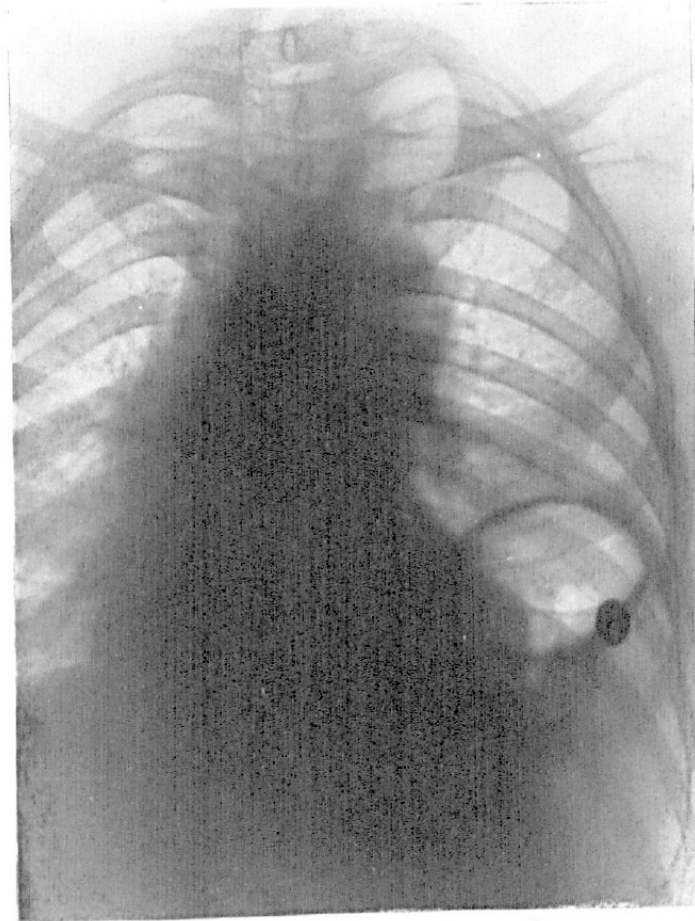


Abb. 8: Großes, aortenkonfiguriertes Herz mit abnormem Zwerchfellhochstand links bei Expirationsstellung (s. Abb. 7). Bei Expirationsstellung noch stärkere Verbreiterung des Mittelschattens als bei Inspiration.

Figure 8: large aortic configured heart with an abnormally elevated diaphragm on the left-end side, after exhaling

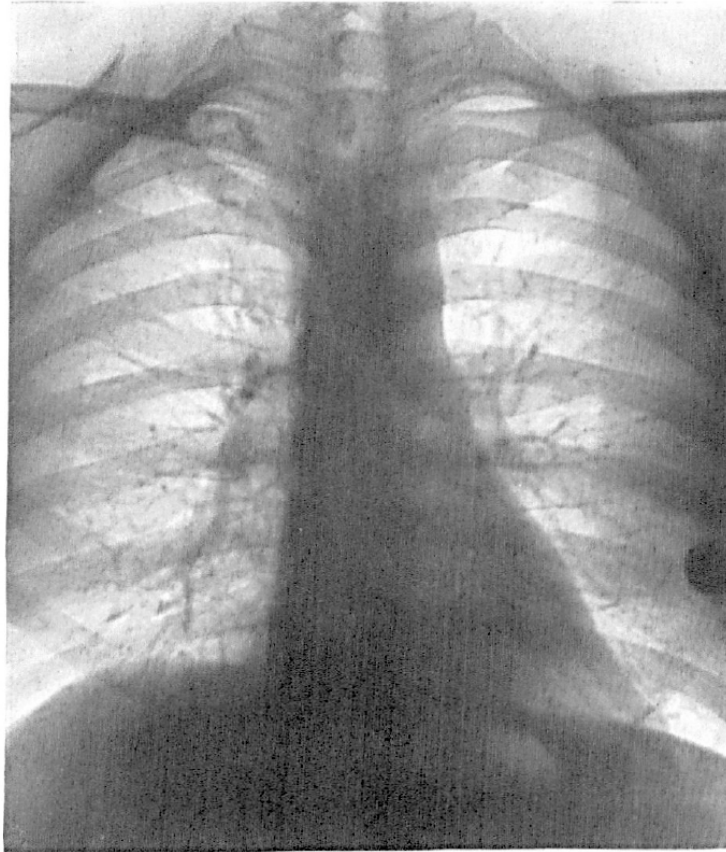


Abb. 9: Gesundes Herz bei Zwerchfellinspirationsstellung; passive Aorten-Gymnastik.

Figure 9: healthy heart after inhalation; passive aorta gymnastics.

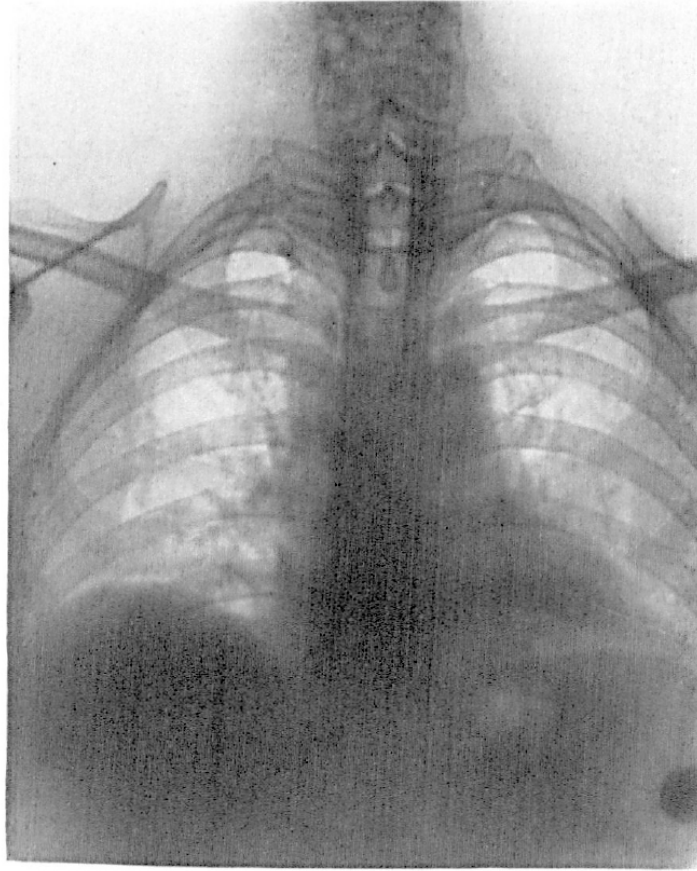


Abb. 10: Dasselbe Herz wie auf Abb. 9 bei Zwerchfellexpirationsstellung; passive Aorten-Gymnastik.

Figure 10: the same heart as in figure 9 after exhaling; passive aorta gymnastics.