

Pulse diagnosis, a reliable diagnostic tool?

Pi | Spleen-Pancreas

Before going into details about pulse diagnosis and pi, the translation of *pi* into *spleen* has to be explained. Pi - 脾 - is translated in all of the Chinese dictionaries as *spleen*. The functions of pi, as presented in '*A Practical Dictionary of Chinese Medicine*', are the following: *the organ that lies against the lower face of the stomach*. [The spleen, known from western anatomy, lies at the left side of the stomach. The described organ must therefore be the pancreas.] *The spleen is ascribed the function of assimilating nutrients from food and drinks in the stomach, to make qi, blood and fluids*. [It has to be noticed that the Chinese *stomach* organ - wei - starts at the lips. From the lips towards the cardia, the sphincter of the entrance of the stomach, is seen as the upper jiao of wei. The middle jiao of wei is the actual stomach organ, with the fundus, corpus, anterior wall, greater and lesser curvature and antrum. The lower jiao of wei-stomach is known from western anatomy as the duodenum, the first part of the small intestine. The main process of transformation of food takes place in the duodenum, induced by pancreatic fluids.] *The spleen governs transformation of grains and fluids and distribution of its essence*. [Transformation of food is guarded by enzymes produced by the pancreas, such as lipase for fats, protease for proteins and different types of enzymes to break down polysaccharides.]

All the above functions of the *spleen*, have to be attributed to the *pancreas*. Modern Chinese makes a distinction between spleen - pi - 脾 -, and pancreas - cui - 胰 -. Western physiology pertains the following functions to the spleen: removal of old red blood cells; reserve of blood in case of hemorrhagic shock; and the main organ to synthesize antibodies, as part of the immune system (second line of defence). Is it possible to see pi, translated as *spleen*, as a part of the wei qi - defensive qi of the body, supporting the gan - liver? While pi, functioning as transformer of food, has to be seen as the *pancreas*?

Each patient will present the acupuncturist with a complex set of symptoms or a western diagnosis. We, as practitioners, need pulse diagnosis as a tool, to confirm the weakest or stagnated qi. The pulse, radial artery on the wrist, is an objective way to confirm the cause of the disease.

What can we diagnose on the pulse of the pi?

Pulse diagnosis confirms the division of pi into the functions of the *pancreas* and *spleen*, as described above. The on the right hand located radial artery has at the middle position, at the level of the processus styloideus of the radius, the location to diagnose the spleen and pancreas. The radial artery can be divided into a superficial and deep part. The superficial part is the location of the wei-stomach, while the deep part

reflects the spleen. In between the two before described layers, on a very small level, the function of the pancreas organ can be diagnosed.

In a normal, healthy condition of the pancreas organ, there is no specific quality felt on this location of the pulse. Only in pathology, like diabetes type II or pancreatitis, a specific quality is felt. Diabetes type II is a failure of the function of the pancreas organ to produce a proper amount of insulin, while diabetes type I is an auto-immune disease, and diagnosed on the gan-liver (chong mai) pulse.

Channels

The four channel systems of the zu tai yin pi jing (the *foot greater yin channel* that transports *essence of pi*) can be diagnosed on the yin aspect of the earth pulse, located on the right wrist. These four channel systems are the jing jin (tendo-muscular system), jing bie (divergent system), jing mai (main channel system) and lu mai (connecting system). In clinical practise it is not common to find stagnation of qi in the jing jin, causing constant and strong pain in muscles of the leg, located at the medial realm of calf and thigh. As known, the jing bie system is connecting physical organs with the jing mai (main channel), to nourish the organs; furthermore it releases perverse qi (emotions) from internally to external. This psycho-somatic system is not one of the most common which get stagnant, causing psycho-somatic pains. The jing mai plays a main role in nourishment of the functions of pi, which will be discussed in the next paragraph. The lu mai is connecting and transporting qi from zu tai yin towards zu yang ming (stomach channel). Besides that, Sp-4 is the master point of the chong mai, which has a mutual action on dai mai, also diagnosed on the same pi pulse.

Transformation & Transportation

Pi governs *transportation and transformation*. The *transformation* aspect is presented by the pancreas through producing enzymes, as explained above. A malfunction of enzyme production will lead to diarrhoea. There are different types of diarrhoea, dependable on which enzyme is not produced properly. A smelly (rotten eggs - H₂S) diarrhoea is caused by improper digestion of proteins, caused by a lack of protease. A fatty foul smelling diarrhoea is caused by an improper breaking down of fat, which could be caused by a lack of lipase, (or a malfunction in bile production, which is a gan-liver symptom). Foamy and smelly loose stools is caused by an improper production of enzymes responsible for breaking down carbohydrates (carbohydrases: maltases, amylases, sucrases, fructases, lactases and others). In all above described cases, the pi pulse will show signs of weakness, caused by jing mai qi xu. The pi extracts the essences from food to transform this into qi and xue-blood. In actual fact, the function of pi includes digestion, assimilation, and distribution of nutrients.

The *transportation* aspect of pi is shown in a proper passage of food bulk or chyme, through the gastro-intestinal tract. Due to an improper production of different types of enzymes, the passage will be accelerated, causing symptoms as diarrhoea. Another view on the concept of *transportation* can be seen in the following quote: *the pi then extracts the essence of grain and water (nutrients like sugars) and dispatches it to*

other organs, so that it reaches all parts of the body. The body needs nutrients to perform cell activity. The main fuel for the cells is glucose, from which there are four types (α -D, β -D, α -L and β -L). The metabolism from polysaccharides towards monosaccharide, and vice versa, is controlled by insulin and glucagons, produced by the pancreas. A malfunction in this process, or a lack of production of insulin, is a weakness of pi jing mai or dai mai. The dai mai is diagnosed on the pulse at the same location as pi.

Connective Tissue

The pi *governs the flesh.* The *flesh* is in some modern books referred to as *muscles*. The muscles are governed by gan-liver, while the central and stabilizing role of pi is seen in *connective tissues - flesh*. There are a few auto-immune diagnoses that harm tissue belonging to pi, connective tissue. Although an auto-immune process is in the first place an invasion of coldness in the wei qi - defensive qi of gan and chong mai, some of them which attack connective tissues can be diagnosed in the pi pulse. Examples of diagnosable auto-immune diseases in the pi pulse are: MCTD (mixed connective tissue disease), sjögren's syndrome, SLE (systemic lupus erythematosus).

Saliva

Pi opens at the mouth. This metaphorical statement mentioned in the Su Wen of the Nei Jing is connected to pancreas functions. In the first place pi (pancreas) qi is in charge of production of amylase, produced by the saliva glands. Except the parotid gland, all the glands in the mouth are governed by pi qi (submandibular, sublingual and minor glands). A lack of production of saliva is due to stagnation of pi qi, felt on the pulse. Some psycho-pharmaceutical medications have as a side-effect an excessive production of saliva, causing dribbling. This is felt on the pi pulse as stagnation, sometimes developing into heat.

A salivary calculus (saliva gland stone) is caused by weakness of shen-kidney qi, or an excess of heat present in shen qi. Nevertheless, the stone is diagnosed and felt on the spleen pulse, as in charge of the tissue of the saliva glands in the mouth. The most common location of the salivary calculi is the submandibular gland.

Immune System

Pi (spleen) qi is in charge of lymph glands. As mentioned above, the main functions of pi are connected to the pancreas organ, which is not a literally translation of pi. With knowledge of western physiology, experience with patients and text from the Nei Jing, this could give the conclusion of the connection between pi (spleen) and lymph glands, as part of second line of defence. The ancient text mentions *pí ké* or *spleen cough*, a complex of symptoms (cough, pain at ribs, shoulder and back, occurring in bouts) that relates to the western diagnosis of flu or a viral infection. The first line of defence is found as the skin, lysozyme, mucous and cilia, combined with already existing antibodies. While the first line of defence is governed by gan-liver (wei qi), the second line of defence is governed by pi-spleen. The second line of defence is regulated by white cells, like lymphocytes, macrophages (monocytes) and granulocytes. Lymph nodes are areas of concentrated lymphocytes and macrophages along the lymphatic veins. The spleen is similar to the lymph node except that it is larger and filled with blood. The spleen

serves as a reservoir for blood, and filters or purifies the blood and lymph fluid that flows through it. If the spleen is damaged or removed, the individual is more susceptible to infections. The jing mai is in charge of nourishing the lymph glands and spleen organ, as part of the immune system. Weakness of this aspect of the defence system of the body is diagnosed in the pi pulse. In particular, the creation of antibodies against viruses, like verruca, moluscum and many other types, is one of the main functions of lymph glands and the spleen. Plasma cells, or plasmocytes, are *transported* by the lymphatic system. Like all blood cells, plasma cells ultimately originate in the bone marrow; however, these cells leave the bone marrow as B-cells, before terminal differentiation into plasma cells, which usually happens in lymph nodes.

The bone marrow is the source of the production of all blood cells. The Nei Jing mentions that pi *manages the blood*. This managing of the blood is expressed as follows: *it plays an important role in **blood formation** and also prevents extravasation of blood. The pi is the **source of blood** and qi formation, and when healthy it ensures plentiful supplies of qi and blood in the body, and since qi contains the blood, the pi both engenders the blood and contains it.* (a practice dictionary of Chinese medicine)

Glands

The two paragraphs before describe two different types of glands, saliva glands and lymph glands. Besides the connection of pi and some endocrine glands, described later in this text, the sebacious glands are governed by pi qi. Stagnation of pi qi, diagnosed on the spleen pulse, is the cause of acne, keratosis pilaris or a sebacious cyst. If the stagnation last for longer time or is more stubborn, the stagnant qi can change into heat, with its related expression in the symptoms.

Dai Mai

The dai mai is diagnosed at the same location as the pi, the middle part of the radial artery on deep level of the right hand. Besides some specific functions, the dai mai is related to the hormonal aspect of the pi (pancreas) functions, like the production of insulin and glucagons. Diabetes type II, is therefore diagnosed on the yin part of the earth pulse.

The other functions of dai mai are: serves to bind up all the channels running up and down the trunk and regulating the balance between upward and downward flow of qi in the body.

General

As presented above, the pi has two different aspects, one belonging to the pancreas organ and one more related to the spleen and its lymphatic system. In acupuncture terms, it could be presented as the yang and yin aspect of pi. The yang aspect of pi is the production of hormones (insulin and glucagons) and enzyme creation, while the yin function is the lymphatic system, lymph nodes and the spleen. The yang aspect of pi is diagnosed on the radial aspect of the pi pulse, while the yin functions are diagnosed on the ulnar side of pi pulse. Does this mean that we needle only spleen points on the right (yang) side of the body if the yin aspect of pi is weak, and on the left (yin) side of the body if the yang functions of pi are weak?

What can we feel more on the pi pulse and should be part of diagnosis?

The Nei Jing, Nan Jing and Jia Yi Jing presents a rather small part, as known from western physiology, of organs and tissues. There are many more important structures not mentioned in ancient texts. All these structures are discovered in the clinic, and confirmed by medical examinations, like ultra sound, mri, pet-scan, x-ray, etcetera. This series of articles will disclose all known structures, not mentioned in ancient books.

Ovaries

The ovaries, as endocrine glands, are diagnosed on the location of the pi pulse. The functions of the ovaries are governed by shen-kidney (responsible for maintenance of the dormant ovi, and production of progesterone) and gan-liver (responsible for development of a ovum during follicular phase and production of oestrogen). The tissue of the ovary is diagnosed on the pi pulse. Pathology diagnosed at the pi pulse are ovarian cysts. An invasion of *huo-heat* into the ovaries is causing a reaction of *cooling*, forming a small bladder filled with watery liquid. The heat can be caused by long intake of contraceptives or over-stimulation with hormones in processes like IVF. The pulse will give a fiery and sharp sensation. The left ovary is felt on the ulnar side of the pulse, while the right ovary is diagnosed on the radial side. A so-called *chocolate cyst* can also be diagnosed at the pi pulse. A chocolate cyst is a small bladder filled with old blood instead of watery liquid, which has the colour of chocolate. This indicates a process of more invading heat. A dermoid cyst can not be diagnosed on the pulse.

Thyroid

The next endocrine, strongly connected to the ovaries and diagnosed on the pi pulse, is the thyroid gland. The thyroid is one of the largest endocrine glands, with a butterfly shape, producing thyroxin. This hormone (t-4) is altered in the liver organ (T-3) to perform a main role in the metabolism of the body. The tissue of the thyroid is diagnosed on the pi pulse, while the function (production of hormones) is governed by shen-kidney and chong mai. The pulse of the chong mai, also gives the location of autoimmune diseases of the thyroid, like hashimoto and graves disease. A cyst in the thyroid, known as a *hot node* or *struma*, can be diagnosed on the pi pulse. The left part of the thyroid is diagnosed on the radial side of the pi pulse, while the right part is diagnosed on the ulnar part.

Parathyroid

There are four parathyroids, located in each quadrant of the thyroid. The function of the parathyroids is the regulation of calcium balance in the blood and bones. The level of calcium is crucial for the nervous system and muscles function. The function responsible for creation of parathyroid hormone is governed by shen-kidney, in cooperation with chong mai. The four glands, with the size of a rice grain can be can only be diagnosed in pathological conditions, on the pi pulse. Only in pathologies like hyperparathyroidism, in which the parathyroid produces an excess of hormone, something abnormal is felt on the pi pulse. In this last example, heat is felt in one of

the four quadrants of the pi pulse. The size of the pathological parathyroid can be enlarged like an olive or grape. The superior-left parathyroid is felt on distal-radial pi pulse, superior-right on distal-ulnar, inferior-left on proximal-radial and inferior-right on proximal-ulnar quadrant.

(As an aid of memory, one holds the right hand downwards, palm facing frontal, to find the location of the ovaries [right ovary - radial pi pulse; left ovary - ulnar pi pulse], while the hand is held upwards to find the anatomical location of the (para-) thyroid on the pi pulse [left part of thyroid - radial pi pulse; right part of thyroid - ulnar pi pulse]. For the parathyroid the same position of the hand is used, while the superior glands are distal, and the inferior located proximal on the pi pulse).

Herpes Zoster

Once one is infected with the varicella virus, causing chicken pox, the virus is nesting in nerve cell bodies. The produced antibodies will keep the virus dormant or latent. If the immune system gets weakened, by any means, the virus could become active and causes a one-sided painful skin rash. It is often seen that in conditions of emotional crises, shingles gets active. The pulse will reflect a weakness of pi qi, while the invader, which is of cold nature (virus), causes a reactive heat felt on the dan-gallbladder pulse. The partners pi-spleen and dan-gallbladder (couple in the heavenly stems) will show on the pulse a weakness of the yin organ (pi) and a false excess of the yang organ (dan). The one-sided belt shape skin rash is caused by weakness of dai mai.

Shock

An extreme daily life event, causing a shock, will be reflected on the pi pulse. The shock causes stagnation of pi qi, diagnosed as a weak or empty spleen pulse.

What can we feel more on the pi pulse, and should not be part of diagnosis?

The qi of pi is not so much harmed and affected by side effects of medications or other external influences, as we saw with the xin-heart qi, as reflected in the pulse. Psychiatric, anti-epileptic, antibiotics and other medications have their effect on xin qi, reflected by the xin pulse. As well as a stent, contact lenses, laser treatment of the lens of the eye, vitamins (C), minerals, and herbal medicines have their reflection on the xin pulse.

In children, younger than 16 up to 18 years old, it is normal when a changing spleen pulse (in quantity) is felt. If one feels the pulse, and it seems to be empty or very full, just wait a minute or two and it will change. This is a rather normal condition for the spleen qi, finding its centre during puberty. In toddlers this changing of the qi is seen in the changing of the reddish colour of the lips, often in a rhythm of three minutes.

Peter C. van Kervel