Author’s response to reviews

Title: In-vivo visualisation of the anatomical structures related to the acupuncture points Dai mai and Shen mai by MRI. A single-case pilot study.

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Author’s response to reviews: see over
The authors have mostly addressed the comments. However, some problems remain with the figures and text (see below).

The figures are still unclear. In Figures 3-5, does the intersection of red and blue lines indicate the estimated position of the needle tip? This should be stated more clearly. In Figure 7 the text refers to “the artefact of the tip of the needle” but it is not clear whether the arrow indicates the tip or just the general needle location.

The figures have been replaced by a transversal and a sagittal view using the original data set with a size of 320 x 320 pixels. We have avoided interpolations that might blur the images.

Fig. 4 and 5 are for the Dai mai point, Fig. 6 for the Shen mai point.

The last paragraph of the discussion (page 8) should be deleted, since specific effect of “vision-related” acupuncture points (compared with non-acupuncture control points) on the visual cortex have not been demonstrated. The original article cited by the authors (reference 13) has been retracted (Proc Natl Acad Sci U S A. 2006 Jul 5;103(27):10527. Epub 2006 Jun 21).

The reference from Cho has been deleted. It is our mistake not to have been up to date on this issue. Thank you.

Other references dealing with this topic have been included.

Missing labels on figures: The figures have been reduced to a self-explaining format, i.e. an arrow that shows the direction of needle insertion. The type of artifact produced by the needles is explained in the discussion. The depth of the artifact corresponds to the depth of needle insertion.

Since this comment has not been specified, we cannot provide an answer. We have asked for a precise question, however our plead remain unanswered.

A banana was used as an experimental object for the evaluation of the practicability of using either stainless steel or gold needles. The use of the objects was important for the evaluation of the image quality in relation to the length of the inserted needle.

The background has been limited to imaging procedures.

The references cited by reviewer 3 also do not deal at all with the characterization of acupuncture points using MRI (see Addendum at the end).

The phrasing used by the reviewer: “This is true but there is some e.g.” is incomplete.
of ascertaining the anatomical correlates of acupuncture points using MRI.
The background has been limited to imaging procedures.

Reviewer 1 has also asked for more information such as ethics, the revision does not contain this.
The suggestion of the local ethics committee was to carry out a pilot experiment prior to any series with patients. This pilot study evaluates the feasibility.

I would add that that format of the study needs to be explained fully so that the study could be replicated if needed.
The format of the study has been summarized in a graph, Figure 7.

i.e. what needle was inserted first, how long was it in, at what point did the subject enter the scanner etc. More importantly, how sure were the authors that the needle was inserted into the acupuncture point. Was this validated by anybody, was deqi obtained what experience did the practitioner have in this field (how many years experience/ training).
The text contains the statement that only gold needles were used.
The needle was inserted and the subject entered the scanner immediately after. Imaging was started within 5 minutes.
The experience in acupuncture is of 5 years, having more than 200 treatments where points of the Yang qiao mai, Yin qiao mai, Dai mai and Chong mai are used regularly. Therefore the practice in using the points Shen mai and Dai mai is sufficient.
The experience was obtained, however reviewer 2 had asked to leave out the discussion on this topic.

Is this paper a description of two separate studies (page 4)? If so it should be described as such.
The needles were placed in a closed glass container not a closed glass.
Scientific work is a dynamic process. The study included an evaluation of the needle material in the first place, i.e. stainless steel vs. gold needle. Only the gold needle had adequate properties for further use in the MRI environment. See figure 7.

Page 5 describes a neutral needling technique, I have never heard this phrase used before in 12 years of acupuncture practice and 10 years of research. Perhaps it could be explained.
Neutral needling is: Ping Bu Ping Xie which is described as an equilibrated tonification and dispersion technique. We regret to hear that the reviewer has never heard about Ping Bu Ping Xie. This is easily explainable through the different approaches of different schools of acupuncture.

Figures 4,5 and 6 do not state which types of needle they are showing. How did the scan images of the steel needles differ from the gold? This should be explained.
All imaging experiments were done with the gold needles.
No in-vivo imaging was done with stainless steel needles.

This study is designed to centre around feasibility, hence the point on page 8 regarding connective tissue contraction is irrelevant, particularly as this study used only 2 acupuncture points, it is rather too early to claim that there is a tie in with connective tissue contraction.
The last paragraph of the discussion is also irrelevant to this study and should be deleted. Reviewer 2 asked for

The theory of connective tissue being involved comes from H. Langevin, not from us. We are just discussing the literature.
The last paragraph is of importance for us! It is our duty to inform the readers about the thoughts involved in the study, thus it is not irrelevant to mention why we work on these points when thinking of eye diseases. The feet and the eyes are important in posture, gait and balance. Our preliminary results show that...
It would be much more valuable to discuss the merits of steel versus gold needles, how much the movement of the steel needles might become a problem, are they likely to be pulled out by the field, how can the artefacts around the needles be minimised, why are they there etc.

No in-vivo imaging was done with stainless steel needles.

Given that there is lack of definition around the image of the needle, is the conclusion given valid?

The identification of the anatomical structures is done by looking at the tip of the needle which corresponds to the depth void volume. This is known to persons actively involved in MRI imaging when biopsy needles are used. The tip of the artefact shows the position of the tip of the needle. We have added a reference on this topic.

We thank all reviewers for their comments.

Moncayo, Rudisch and Kremser
Innsbruck, June 25th, 2006
Addendum: comments on the references cited by reviewer 3.

Kovacs refers to the anatomical vessels in the sense of blood vessels and not in the sense of vessel or meridian. There is no description of anatomy in the paper [1].

Lazorthes refers to the use of radioactive tracer after using the following points: LI4, LI11, LI14, SI3, TH5, GB34, Ren mai 12, and Du mai 4. The points do not coincide at all with our approach. The most important anatomical aspect found here is that the amount of radioactivity in the blood was negligible after the acupuncture points had been injected, thus meridians and blood vessels are not related. They do not describe any anatomical structures [2].

Salzberg presents basically a review centered on the treatment of pain [3]. This can be recognized through the EMTREE medical terms which include: acupuncture analgesia; electroacupuncture

Chan emphasizes the relation of acupuncture points to the nervous system based on indirect evidence [4]. Our approach is different, since we look directly at the anatomy of the points.

Bensoussan: refers to nerves and vessels. No MRI data [5].

Melzack worked already 1977 (and earlier) on the relation between acupuncture points and trigger points [6]. The theory on the gate control theory of pain does not make any description of anatomical correlates to acupuncture points.

Dung takes a symptom-related approach in order to describe the tenderness properties of the acupuncture points dividing them into categories [7]. The term used is: “sensitive point”. There is only a vague description of the anatomy, mostly based on topographical knowledge.

Ciszek: no PDF file available. No comment [8].

Bossy described originally a relation of acupuncture points to vessels and nerves in dissection material [9]. In a later contribution the emphasis was put on the nervous structures [10].

Bong Han: not found. No comment.
Reference List


