Author's response to reviews

Title: Usefulness of screening tools in the evaluation of long-term effectiveness of DREZ lesioning in the treatment of neuropathic pain after brachial plexus injury

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Author's response to reviews: see over
Dear editor and reviewers,

Thank you for your comments and recommendations.

We have changed the manuscript according to all your comments and we hope everything is now clear. The article is more understandable.

Authors

Referee 1:

1. The timing of surgery which was so early [before the surgical treatment of the plexus itself] that means a very short time to observe the result of the non-operative pain treatment. There is a possibility that the very good result of this study may come partly from the cases which the pain may be better without DREZ operation.

We agree with you that our management may be different from the others and the pain in some of the patients could resolve spontaneously. However, the patients were indicated for surgery after failure of conservative treatment lasting for several months:

Patients were indicated for DREZ-T after development of severe, unbearable pain in the affected extremity after all types of analgesia (including high dose of opioids, anticonvulsants and tricyclic antidepressants) had been tried and found to be inadequate.

Although some recent papers have described good pain relief after BP surgery itself (i.e. grafting, neurolysis... - the end of our discussion), we still believe that DREZ-T is the only causal therapy of severe intractable deafferentation pain after BPI.

It may be worthy to mention also part of Samii’s discussion in his paper (ref. 17):

Growing numbers of patients are undergoing neurotization procedures (neurotransplantation) at an early stage, and these patients require the neurosurgical treatment of intractable pain as well. The beneficial effect of neurotization on pain after traumatic cervical root avulsion is controversial. ..... A series of 508 patients with traction injuries of the brachial plexus (birth trauma excluded) were studied during a period of 11 years; the effects on pain were sometimes ameliorative but were generally unpredictable.

We think, therefore, that early surgery in such cases should be considered.
2. The other questions are: pre operative investigations, patients selection, addition pain medication, correlation of intraoperative finding and the result etc.

DREZ-T was performed in patients with untreated pain after BPI. Avulsion was detected preoperatively by CT myelography and confirmed by electrophysiological studies:

**Indication criteria**

Patients were indicated for DREZ-T after development of severe, unbearable pain in the affected extremity after all types of analgesia (including high dose of opioids, anticonvulsants and tricyclic antidepressants) had been tried and found to be inadequate. The vast majority of procedures were performed before a planned reconstruction of the brachial plexus. All patients underwent preoperative EMG examination using needle concentric electrodes and nerve conduction studies. CT myelography showed avulsion of minimally two cervical roots in all patients.

**correlation of intraoperative finding and the result:**

*We added the sentence into the discussion:*

It has been stated that there is no correlation between the number of roots avulsed or the extent of the DREZ-T procedure performed and the degree of pain reduction [17].

*We, therefore, believe that further analysis would unnecessarily complicate the results and the conclusion of our article. Also other authors did not differentiate the results between particular subgroups according to number of levels involved... [1,10,14..]*

**Referee 2:**

1. Pain after brachial plexus injury is definately neuropathic pain. To analyse the pain after brachial plexus injury, PD-Q showed wide variations. In some cases, PD-Q suggested nociceptive components mainly. It sounds strange. PD-Q may not be adequate for the evaluation of the pain after brachial plexus injury.

*We have not suggested using PD-Q immediately after BPI or preoperatively. We agree with you that this pain is of neuropathic origin.*

The aim of our study was to examine patients after DREZ-T to find out whether their current problems are residual neuropathic symptoms or different type of pain (nociceptive) which could develop later (arthrogenic or muscle pain from contractures ...).

*We chose PD-Q from two reasons:*
A. For its simplicity and because it does not require a clinical examination.

B. This scale was used for evaluation of neuropathic pain in patients with spinal cord injuries with 78% diagnostic accuracy [14].

Because it’s efficiency has been proven in SCI patients, we thought that it may be useful in BPI patients as well. This was confirmed by our study because residual VAS score highly corresponds to PD-Q score.

Although we agree that the presence of nociceptive component may sound odd, we believe that this finding is true as the “nociceptive” component was typically the minor, often neglected residual symptom...

We added sentences into Discussion:

The presence of nociceptive pain after brachial plexus injury seems to be unexpected. However, it may originate in the areas of preserved nerve supply in incomplete injuries or develop later in the areas reinnervated by neurotization.

2. Aly MM et al (Neurosurgery 2011 and Acta Neurochir 2011) reported that brachial plexus injury has two types of pain, paroxysmal and/or continuous pains. Only paroxysmal pain responded well to DREZotomy. Prof Sindou agreed in his comment in Neurosurgery 2011. So the authors should suggest the correlation of the paroxysmal pain and the effect of DREXotomy.

This topic has been discussed by Sindou et al (Aichaoui, ref. 1) in Pain 2011. Also the others reported the same experience. You are mentioning Aly’s MM Letter to the editor (Acta Neurochir 2011) who commented the work of Bonnla et al. (Acta Neurochir 2010, our reference No. 7). The general opinion is that the paroxysmal shooting pain has the highest response rate to DREZotomy. This fact is discussed in our article as well:

The best results have been achieved in sporadic irritations while persistent dull pain had a worse prognosis and higher tendency to recur [1, 19]. This is in accordance with our study ... Our results are also parallel those presented in the broader literature [1,10,19,22].

New reference No 19:


We added one sentence with ref. 24 into Discussion:
Aly et al. reported that electrical motor cortex stimulation is more effective for continuous than paroxysmal pain after brachial plexus injury [24].


Referee 3:

The manuscript is well written and provides fresh objective data on the outcome of patients undergoing DREZ thermocoagulation for brachial plexus injuries. The standardized outcome data is significantly stronger than prior outcome data based solely on VAS scores.

Thank you for your comment.