Original Research Article

Management of Complex Regional Pain Syndrome Type I in Upper Extremity—Evaluation of Continuous Stellate Ganglion Block and Continuous Infraclavicular Brachial Plexus Block: A Pilot Study

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Abstract

Interventional pain management techniques play an important role in the multidisciplinary approach to management of complex regional pain syndrome (CRPS). In this preliminary study we compared the efficacy of continuous stellate ganglion (CSG) block with that of continuous infraclavicular brachial plexus (CIBP) block in management of CRPS type I of upper extremity.

Methods. Thirty-three patients with CRPS type I of upper extremity were randomly assigned to either CSG or CIBP group. Patients were treated for 1 week with continuous infusion of 0.125% bupivacaine at 2 and 5 mL/h, respectively. Catheter was removed at 1 week and patients were followed up for 4 weeks.

The outcome was evaluated in terms of neuropathic pain scale score (NPSS), edema scores (Grades 0–2), and range of motion (ROM) of all upper extremity joints (Grades 0–2).

Results. CIBP group showed statistically significant improvement in NPSS compared with CSG group during the first 12 hours after the procedures (P value <0.05). After 12 hours, the NPSS was comparable between the groups. At 4 weeks, both groups showed clinically significant improvement in edema score and ROM of all upper extremity joints when compared with the baseline.

Conclusion. This preliminary study suggests that CIBP block and CSG block may be feasible and effective interventional techniques for the management of CRPS type I of upper extremities. Hence, we recommend a larger well-randomized, well-controlled, clinical trial to confirm our findings and determine if any significant difference exists between the groups in terms of long-term pain relief and functional restoration.

Key Words. CRPS; Sympathetic Block; Interventional; Nerve Block; Pain Management; Physical Therapy

Introduction

Complex regional pain syndrome (CRPS) is defined as chronic pain with neuropathic characteristics [1]. Thus, when CRPS is present, persistent pain and hyperalgesia follow injury and are associated with sensory, motor, autonomic, and trophic disturbances that commonly extend far beyond the original site of injury. In the absence of any gold standard test to diagnose CRPS, International Association for the Study of Pain (IASP)/CRPS diagnostic criteria (Table 1) were used to enroll patients in our study [2].
Optimum management of CRPS involves a multidisciplinary coordinated approach, aimed at functional restoration [3]. Interventional pain management techniques are integral to such a multidisciplinary approach [4]. Interventional techniques used range from Bier’s block to neuromodulation [5]. The most commonly performed interventional procedures are either sympathetic blocks or somatic nerve blocks with local anesthetics, if sympathetic block fails. Somatic nerve blockade with local anesthetics impedes conduction of action potentials along sympathetic efferent, somatosensory C- and A-delta afferent fibers, and also motor fibers [6–8]. By contrast, sympathetic blockade provides pain relief by blocking the conduction of only pain afferent fibers and sympathetic efferents, which traverse along the sympathetic supply to the extremities and provide no motor blockade. For upper limb CRPS type I, stellate ganglion blocks with local anesthetics have shown to be effective in treating pain [9]. Similarly, brachial plexus blocks have also been shown to improve pain in upper limb CRPS [10]. There are several case reports noting successful use of either continuous stellate ganglion (CSG) block [11,12] or continuous brachial plexus block [13,14] for management of upper limb CRPS type I. We conducted this preliminary study to compare and evaluate the efficacy of CSG block and continuous infracavicular brachial plexus (CIBP) block in upper limb CRPS type I patients. Novel catheter fixation techniques for CSG and CIBP blocks were used and are detailed.

Methods and Materials

After obtaining institutional research ethics committee approval, 33 patients aged 16–65 years with CRPS type I of the upper extremity were enrolled in the study. All the patients were diagnosed to have CRPS type I for at least 3 months and were refractory to medical management. Informed written consent was obtained from all patients and then they were randomly assigned to receive CSG block or CIBP block using a computer-generated table of random numbers (50 numbers in two columns). Group allocation was concealed in sealed opaque envelopes that were not opened until patient consent had been obtained.

Patients with history of local anesthetic allergy, psychiatric disorder, or any interventional procedure for the present condition were excluded from the study. Three patients were dropped from the study. One patient from each group was excluded from the study as their catheters became dislodged during the follow-up period, and one patient in the CIBP group was excluded because he failed to follow up after 2 weeks. Finally, we had 18 patients in the CSG group and 12 patients in the CIBP group for statistical analysis.

All patients were educated about the neuropathic pain scale score (NPSS) [15] and each component of the scoring was individually explained to the patient before the procedure (Appendix 1). A peripheral intravenous catheter was placed before the procedure, and electrocardiogram (EKG) monitoring, non-invasive blood pressure, and pulse oximetry were used during the procedure. All patients received sedation for catheter placement. All patients were admitted for 24 hours to an observation unit immediately after the block.

The following parameters were recorded before and at 6 minutes, 30 minutes, 2 hours, 12 hours, and 24 hours after the procedure: vital signs (blood pressure, heart rate), NPSS (0–10), temperature difference between bilateral upper extremity (thermometry score) (0—No difference; 3—Difference >2°C), plethysmography score (0—Waveform amplitude reading of 2; 4—Waveform amplitude reading of 50), edema score (0—No edema; 2—Severe edema [skin is tight and shiny]), and range of motion (ROM) at shoulder, elbow, wrist, and finger joints (0—No restriction of active movement; 2—Severe restriction of active movements).

CSG Block

The patient was positioned supine with neck extended and mouth slightly open to relax the neck musculature. They were instructed not to swallow or speak during the course of the procedure. The neck on the affected side was cleaned, swabbed three times with betadine solution.

### Table 1

The International Association for the Study of Pain/complex regional pain syndrome diagnostic criteria

1. Continuing pain which is disproportionate to any inciting event
2. Must report at least one symptom in each of the four following categories:
   - **Sensory:** reports of hyperesthesia
   - **Vasomotor:** reports of temperature asymmetry and/or skin color changes and/or skin color asymmetry
   - **Sudomotor/edema:** reports of edema and/or sweating changes and/or sweating asymmetry
   - **Motor/trophic:** reports of decreased range of motion and/or motor dysfunction (weakness, tremor, dystonia) and/or trophic changes (hair, nail, skin)
3. Must display at least one sign in two or more of the following categories:
   - **Sensory:** evidence of hyperalgesia (to pinprick) and/or allodynia (to light touch)
   - **Vasomotor:** evidence of temperature asymmetry and/or skin color changes and/or asymmetry
   - **Sudomotor/edema:** evidence of edema and/or sweating changes and/or sweating asymmetry
   - **Motor/trophic:** evidence of decreased range of motion and/or motor dysfunction (weakness, tremor, dystonia) and/or trophic changes (hair, nail, skin).
and sterile draped. The cricoid cartilage was palpated and fingers were rolled laterally to push the sternocleidomastoid laterally along with the carotid artery. A wheal was raised with local anesthetic (2% lidocaine) and a 20G IV cannula with holes in the wings (Figure 1A) was inserted until the C6 tubercle was contacted. The stylet was then removed and the cannula was vertically sutured to the skin (Figure 1B). The position of the cannula was confirmed by injecting 2 mL of radio-opaque dye and noting the free flow and spread of dye along the vertebral column and over transverse process under fluoroscopy (Figure 1C). The cannula was then securely fixed with the support of sterile gauzes, which were partially cut in the middle and taped to the neck (Figure 1D). This fixation technique has been shown to have a very low migration rate in a study conducted at our clinic (personal communication).

A bolus of 10 mL (5 + 5 mL) 0.25% bupivacaine was injected after negative aspiration through the cannula. An elastomeric pump containing a solution of 0.125% bupivacaine 280 mL delivering at 2 mL/h was attached to the cannula (Figure 1E). The pump was changed on day 5 and continuous infusion of 0.125% bupivacaine was maintained for 7 days.

CIBP Block

The CIBP was identified using nerve stimulation by vertical approach as described by Kilka et al. [16] using a Contiplex® D* set (20G contiplex D 21/2" needle with Contiplex® Catheter 0.41 x 0.71 x 400 mm, connector, filter, pin pad, and syringe). The position of the catheter was confirmed by injecting 3 cc of radio-opaque dye and noting free flow and spread of dye under fluoroscopy. The catheter was then fixed to the skin by suturing the catheter at three points and securing it with Mastisol liquid adhesive and Steristrips at the insertion site (Figure 2). We innovated this fixation technique after first study case had catheter dislodgement after 4 days of catheter placement. There was no catheter migration or dislodgement seen with this catheter fixation technique (AIIMS catheter fixation technique).

A bolus of 30 mL 0.25% bupivacaine was injected through the catheter after negative aspiration. The catheter was then connected to an elastomeric pump containing 0.125% bupivacaine 400 mL delivering at 5 mL/h. The pump was changed on days 3 and 6 and continuous infusion of 0.125% bupivacaine was maintained for 7 days.

Evaluation of Sympatholysis After the Block

Sympatholysis after the block was measured in terms of increasing temperature in the affected extremity after the block in comparison with the contralateral extremity (thermometry score—0 = No temperature difference or the affected limb is colder than other extremity; 1 = Increase in temperature of 1–1.5°C in blocked arm; 2 = Increase in temperature of 1.5–2°C in blocked arm; and 3 = Increase in temperature of >2°C in blocked arm). Increase in temperature of >1.5°C in the affected extremity was suggestive of adequate sympatholysis [17]. In this study, all patients showed increases in temperature of >1.5°C in the blocked arm when compared with the contralateral hand after the block and there was no significant difference between the CSG and CIBP groups.

Sympatholysis was also assessed by the degree of vasodilatation seen in the affected extremity after the block (plethysmography scores—0 = Waveform amplitude reading of 2/least capillary circulation; 1 = Waveform amplitude reading of 5; 2 = Waveform amplitude reading of 10; 3 = Waveform amplitude reading of 20; and 4 = Waveform amplitude reading of 50 (maximum capillary circulation)). An increase in the waveform reading score by 2 was taken as an indicator of improvement in capillary circulation secondary to sympatholysis/vasodilatation [18]. All patients showed improvement in capillary circulation at 30 minutes after the block and again there was no significant difference between the two groups.

Follow-up Evaluation

During the first 24 hours, patients were seen at 6 minutes, 30 minutes, 2 hours, 12 hours, and 24 hours after the block. Vital signs, NPSS, thermometry score, plethysmography score, edema score, and ROM at shoulder, elbow, wrist, and fingers were evaluated at each visit. All the patients in this study were evaluated and treated by the same physical therapist. Physical therapy was started in the hospital as soon as the patient felt comfortable (usually within 30 minutes in either group) after the block. All the patients received same type of physical therapy as per the recommendations of the physical therapist. The patients were advised to regularly follow up with the same physical therapist, to maintain the continuity of care, for 4 weeks.

Patients were discharged home with the catheter in situ attached to the elastomeric pump. Patients were seen every day until day 7 when the catheter was removed in the clinic. After removal, catheter tip was sent for culture. Patients were seen in the clinic every week for 3 weeks after catheter removal. During each follow-up visit, NPSS, edema score, and ROM at shoulder, elbow, wrist, and fingers were evaluated. All patients continued their other medications and physical therapy during the course of their treatment.

At 4 weeks, all patients were asked to fill out a satisfaction score (patient satisfaction score—0 = Completely dissatisfied and 10 = Fully satisfied).

Statistical Analyses

To examine mean differences in scores of different components of NPSS, a two-way analysis of covariance procedure was performed, holding each of these variables as a continuously scaled dependent variable in the models. The factor variables were identified as procedure type (CIBP vs CSG block) and time point of measurement (15 time points: preprocedure through 4 weeks). Differences in preprocedure scores were controlled for as a covariate in the model between the two groups. Statistically significant differences were considered achieved at a P value...
Figure 1 Continuous stellate ganglion (CSG) block. (A) shows the IV cannula with holes in the wings. (B) shows the technique of suturing the catheter vertical to the skin. Arrow in (C) shows the spread of radio-opaque dye under fluoroscopy. (D) shows the technique of securely fixing the catheter with split sterile gauzes and paper tape. (E) shows CSG catheter connected to ambulatory elastomeric pump.
Results

Demographics

Demographic variables including age, gender, body mass index, and duration of pain prior to this treatment were comparable between the groups (Table 2). There was no statistically significant difference ($P$ value <0.05) in hemodynamic parameters between the groups, before or after the procedure, except for a greater decrease in heart rate at 6 minutes after the CSG block than the CIBP block. This decrease was not clinically significant as the heart rate never fell below 60.

Neuropathic Pain Scale Score

Each component of NPSS was individually analyzed. The mean baseline scores of each component in NPSS were comparable between the groups. There was a statistically significant decrease in each component with their baseline scores (Figure 3A–D). Intensity of pain (visual analog scale [VAS]) (Figure 3A) and unpleasantness scores (Figure 3D) were significantly lower ($P$ value <0.05) in the CIBP group at 30 minutes, 2 hours, and 12 hours when compared with the CSG group. Patients in the CIBP group had statistically significant reductions in deep pain scores at 30 minutes, 2 hours, 12 hours, and 24 hours when compared with the CSG patients (Figure 3B). Similarly, dull pain score was also significantly lower in the CIBP group at 2, 12, and 24 hours compared with the CSG group (Figure 3C). There was no statistically significant difference between the groups for all other components in NPSS. However, there was a clinically significant improvement in the quality of pain in both groups. One hundred percent of the patients in the CSG group and 91.7% of the patients in the CIBP group had background pain with intermittent flare-ups at the time of presentation. However, at 4 weeks, four out of 18 (22.2%) patients in the CSG group had background pain with intermittent flare-ups as compared with only one out of 12 (8.3%) patients in the CIBP group. Constant background pain was persistent in 11.1% (2/18) and 8.3% (1/12) of the patients in the CSG and CIBP groups, respectively. Occasional intermittent pain was present in 66.7% (12/18) of the patients in the CSG group as compared with 83.4% (10/12) of the patients in the CIBP group at 4 weeks.

Edema Score

83.3% of patients in the CSG group and 91.7% of patients in the CIBP group had originally presented with severe edema (skin is tight and shiny). At 4 weeks, there was a clinically significant improvement in edema scores in both groups and none of the patients had severe edema. However, no significant difference was noted between the groups.

Range of Motion

There was clinically significant improvement in ROM at all the joints in both the groups compared with their baseline (Figure 4A–D). However, in the CIBP group, patients had initial weakness in the blocked extremity secondary to motor block. This improved over time and none of these
patients had prolonged motor weakness. At 4 weeks, there was no significant difference in ROM at all the joints between the groups.

Overall patient satisfaction score was 7.78 ± 1.309 in the CSG group compared with 7.92 ± 0.996 in the CIBP group. There was no statistically significant difference between the groups.

Adverse Effects

The most common adverse effect in the CSG group was Horner’s syndrome (94.7%) while initial motor weakness (100%) was the most common adverse effect in the CIBP group. Positive catheter tip culture was seen in 11/18 (61.1%) patients in the CSG group while only one patient (8.3%) had a positive tip culture in the CIBP group. The catheter tip culture may or may not indicate puncture site infection. None of the patients had clinically evident signs of infection at the catheter site after discontinuation of the catheter. Catheter migration was seen in 1/19 (5.2%) patients in the CSG group and 1/14 (7.1%) patients in the CIBP group. In these patients, the initial symptom was increase in pain score, and when contrast dye was injected, catheter was dislodged from their initial position.

3/18 (16.7%) of the patients in the CSG group had hoarseness of voice for the initial 12 hours after the block.

Discussion

This preliminary study suggests that both CIBP block and CSG block are feasible and effective interventional therapeutic options for management of CRPS type I. Even though the patients with CIBP block showed significantly lower pain scores when compared with the patients with CSG block during the first 12 hours, there was no significant difference in long-term pain relief and functional restoration between the two groups, and the absence of significant difference between the two groups may be due to large deficit in power of the study.

CRPS is a clinical diagnosis based on criteria that include hyperalgesia, sudomotor, and trophic changes [2]. We included only CRPS type I patients in this study and used IASP diagnostic criteria to maintain uniformity in clinical diagnosis. Central nervous system involvement in the CRPS type I has been shown in several studies. There are evident neuroplastic changes in cortical circuitry. Patients with CRPS type I typically have restricted active ROM,
whereas passive movements are often possible. Neuroimaging studies have shown that patients with CRPS type I have decreased hand representation in contralateral S1 cortex, increased activation in brain areas related to affective-motivational pain processing, i.e., mainly frontal and cingulate cortices, and finally, significant reorganization of central motor circuits (primary motor, parietal and supplementary motor cortices) [19]. However, it is also proven that the plastic cortical changes are reversible under sufficient treatment [20].

Management of CRPS type I involves a multidisciplinary coordinated approach, aimed at functional restoration. Physical therapy plays a critical role in achieving this goal. Physical therapy for CRPS type I should include gentle ROM exercises within patient’s tolerance. Medications and regional blocks aim at improving patient’s pain so that they can actively involve in physical therapy without much discomfort. Both sympathetic and somatic nerve blocks have been shown to be very effective in improving patient’s tolerance to physical therapy. However, there is no evidence in support of the present practice of using sympathetic blocks as first line treatment and considering somatic nerve blocks, if sympathetic nerve block has failed [21]. In this study, we compared the efficacy of a sympathetic block and a somatic block and both techniques are found to be effective in controlling pain, and improved the tolerance to physical therapy among our patients. However, in patients with somatic nerve blocks, we need to be careful and avoid aggressive mobilization and strengthening programs in view of possible dislocations and muscle injury that may go unnoticed. Decreased pain and improved tolerability to physical therapy may in turn lead to positive input to the motor regions in the brain. This may help to revert back the plastic changes in cortical areas seen with CRPS type I. This could explain the significant improvement in functional restoration seen in our patients in both the groups. However, this finding could be a placebo effect, natural course of the disease, or could be the effect of physical therapy or local anesthetic that is systemically absorbed. These confounding factors could have been taken into account if we had a control group in our study. Hence, our future direction would be to perform a similar randomized clinical trial with a control group or perform a trial with a crossover type of study design with a patient acting as their own control.

The role as a diagnostic sympathetic block to differentiate between sympathetically mediated pain and sympathetically independent pain remains questionable. Cepeda

Figure 4 Graphs for range of motion at (A) shoulder, (B) elbow, (C) wrist, and (D) finger joints. There was clinically significant improvement in range of motion in all joints at 4 weeks when compared with their baseline range of motion in both the groups. * = Clinically significant difference in range of motion between the groups seen in wrist joint at 4 weeks. CSG = continuous stellate ganglion block group; CIBP = continuous infraclavicular brachial plexus block group.
et al. had shown that the response to sympathetic block is usually partial (41%) or absent (22%) in patients with CRPS [22]. Even though intermittent stellate ganglion block remains the treatment modality of choice for sympatholysis in upper limb CRPS, repeated blocks are usually required to achieve the desired results [9]. A study conducted at our clinic has shown that CSG is feasible and safe and has better outcome compared with repeated intermittent stellate ganglion block (personal communication). CSG was performed by the C6 anterior approach because of simplicity and safety of catheter placement using this approach.

In their study, Detaille et al. [13] have shown that continuous interscalene block significantly decreases pain and improves ROM in shoulder joint in first month after the block. Our study confirms their findings and shows that CIBP block is feasible and effective interventional technique to manage CRPS type I. Among several approaches for brachial plexus block, the infraclavicular approach was chosen in view of its safety profile and feasibility for continuous infusion via a catheter. The “vertical” infraclavicular approach was used for CIBP in this study [16,23,24].

Limitations of the Study

1. By conducting this experimental, pilot study we have provided an original contribution to the field by obtaining an effect size between study groups (hypothesized equivalence and range that still results in equivalence) relative to improvement in pain. To substantiate these pilot results, a larger, properly powered, randomized controlled clinical trial needs to be performed whereby other possible confounding variables (i.e., placebo effect, Hawthorne effect, regression to the mean, natural history of the disease, secular trends, general effect of systemic absorption of local anesthetic, general effect of initiating physical therapy, or the specific effect of anesthetizing selected nerves in combination with physical therapy) can be examined in a much more informative way in an effort to achieve clinically important benefits.

2. Different infusion rates of local anesthetic for CIBP block and CSG block were used in this study, based on present evidence from the regional anesthesia literature, which show that the local anesthetic infusion rates used for continuous brachial plexus block range from 4 to 6 mL/h, and we used 2 mL/h for CSG block based on our clinical experience. However, the amount of local anesthetic absorbed during these techniques is very small and hence, the difference in the infusion rate of local anesthetic between the groups might have had minimal effect, if any, on the results of this study.

3. We evaluated the ROM clinically by using subjective (0–2) ROM scale. Even though goniometer scale would have been an objective measure for evaluation of ROM, we preferred 0–2 ROM scale as it was easier to use and the results obtained were more clinically relevant.

Conclusion

This preliminary study suggests that both CSG and CIBP blocks may be feasible and effective interventional techniques in management of upper limb CRPS type I. Even though the overall satisfaction of the patients with either of the blocks was not significantly different, CIBP block is much easier to perform and manage. Hence, contrary to the present practice of limiting the use of somatic nerve blocks in those patients who have failed sympathetic block, we suggest that CIBP block can be used as a first line interventional technique for management of CRPS type I of upper extremities. However, we recommend further research in this area by conducting adequately powered studies to see if there is any significant difference between sympathetic and somatic nerve blocks in management of CRPS type I and also compare these techniques with a control group to confirm the findings of this preliminary study.

Acknowledgments

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Conflict of Interest and Disclosure

I have nothing to disclose and have no conflict of interest.

References


Appendix 1

Neuropathic Pain Scale Score

Instructions: There are several different aspects of pain which we are interested in measuring pain sharpness, heat/cold, dullness, intensity, overall unpleasantness, and surface vs deep pain.

The distribution between these aspects of pain might be clear if you think of taste. For example, people might agree on how sweet a piece of pie might be (the intensity of the sweetness), but some might enjoy it more if it were sweeter while others might prefer it to be less sweet. Similarly, people can judge the loudness of music and agree on what is more quiet and what is louder, but disagree on how it makes you feel. Some prefer quiet music and some prefer it louder. In short, the intensity of a sensation is not the same as how it makes you feel. A sound might be unpleasant and still be quiet (think of someone grating their fingernails along a chalkboard). A sound can be quiet and “dull” or loud and “dull.”

Pain is the same. Many people are able to tell the difference between many aspects of their pain: for example, how much it hurts and how unpleasant or annoying it is. Although often the intensity of pain has a strong influence on how unpleasant the experience of pain is, some people are able to experience more pain than others before they feel very bad about it.
There are scales for measuring different aspects of pain. For one patient, a pain might feel extremely hot, but not at all dull, while another patient may not experience any heat, but feel like their pain is very dull. We expect you to rate very high on some of the scales below and very low on others. We want you to use the measures that follow to tell us exactly what you experience.

1. Please use the scale below to tell us how intense your pain is. Place an “X” through the number that best describes the intensity of your pain.

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The most intense pain sensation imaginable

2. Please use the scale below to tell us how sharp your pain feels. Words used to describe “sharp” feelings include “like a knife/spike” and “jabbing.”

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The sharpest sensation imaginable (“just like knife”)

3. Please use the scale below to tell us how hot your pain feels. Words used to describe very hot pain include “burning” and “on fire.”

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The hottest sensation imaginable (“on fire”)

4. Please use the scale below to tell us how dull your pain feels. Words used to describe very dull pain include “like a dull toothache” and “aching.”

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The most dull sensation imaginable

5. Please use the scale below to tell us how cold your pain feels. Words used to describe very cold pain include “like ice” and “freezing.”

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The coldest sensation imaginable (“freezing”)

6. Please use the scale below to tell us how sensitive your skin is to light touch or clothing. Words used to describe sensitive skin include “like sunburned skin.”

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The most sensitive sensation imaginable (“raw skin”)

7. Please use the scale below to tell us how itchy your pain feels. Words used to describe sensitive skin include “like a mosquito bite” and “like poison oak.”

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The itchiest sensation imaginable (“like poison oak”)

8. Which of the best describes the time quality of your pain? Please check only one answer.

(····) I feel a background pain all the time and occasional flare-ups (breakthrough pain) some of the time. Describe the background pain: ________________________________

(····) I feel a single type of pain all the time. Describe this pain: ________________________________

(····) I feel a single type of pain only sometimes. Other times, I am pain-free. Describe this occasional pain: ________________________________

9. Now that you have told us the different physical aspects of your pain, the different types of sensations, we want you to tell us overall how unpleasant your pain is to you. Words used to describe very unpleasant pain include “miserable” and “intolerable.” Remember, pain can have a low intensity, but still feel extremely unpleasant, and some kinds of pain can have high intensity but are very tolerable. With this scale, please tell us how unpleasant your pain feels.

<table>
<thead>
<tr>
<th>Not Unpleasant</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<th>10</th>
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The most unpleasant sensation imaginable (“intolerable”)

Sympathetic vs Somatic Block in CRPS
10. Lastly, we want you to give us an estimate of the severity of your deep vs surface pain. We want you to rate each location of pain separately. We realize that it can be difficult to make these estimates, and most likely it will be a "best guess." But please give us your best estimate.

**HOW INTENSE IS YOUR DEEP PAIN?**

<table>
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<th>No Deep Pain</th>
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<th>2</th>
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<th>4</th>
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<th>10</th>
</tr>
</thead>
</table>

The most intense deep pain sensation imaginable

**HOW INTENSE IS YOUR SURFACE PAIN?**

<table>
<thead>
<tr>
<th>No Surface Pain</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<th>10</th>
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The most intense surface pain sensation imaginable