The Role of Fluorescence Angiography in Diagnosis of Complex Regional Pain Syndrome

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Statement of Purpose

The purpose of our retrospective review was to ascertain whether fluorescence angiography may detect change in perfusion to the affected feet in patients diagnosed with complex regional pain syndrome (CRPS) and may aid in the diagnosis of CRPS.

Methods and Hypothesis

Six consecutive patients, who were diagnosed with lower extremity CRPS based on the most current diagnostic criteria as described by the 1994 IASP criteria. At Figure 2a, were included in this study. Patients were excluded if another diagnosis was made to account for their symptoms. Of the six patients, four were female and two were male. Of the six affected feet, three were right feet and three were left feet. The uninvolved contralateral limb of each patient was selected to account the control. All patients exhibited symptoms of CRPS for greater than 6 months prior to undergoing fluorescence angiography. Our hypothesis was that any differences in perfusion between the affected and unaffected feet would be reported.

Procedure

All patients underwent fluorescence angiography of their bilateral feet at a single institution. Intravenous indocyanine green fluorescence dye was administered to one of the lower extremities of all patients. Sequential images were collected over a period of 15-30 minutes to account for the progression of the injection. All images were assessed by a single physician trained in fluorescence angiography, and were categorised as showing decreased perfusion, perfusion, or normal perfusion.

Results

Fluorescence angiography, images of all patients showed decreased perfusion in the feet clinically diagnosed with CRPS compared with the uninvolved contralateral foot. Sequential images taken during the 10.5 minutes period indicated changes in perfusion to the affected feet. No complications were observed or reported by the patients. No statistical analysis was performed due to lack of variability in the results.

Discussion and Analysis

Fluorescence angiography in the diagnosis of CRPS may aid to the assessment of CRPS to allow sequential and real-time visualization of skin perfusion. To our knowledge, fluorescence angiography has not been used in the diagnosis of CRPS to date. In case series, fluorescence angiography provided asymmetrical findings in the presence of clinically diagnosed CRPS in patients with critical limb ischemia. These results demonstrate that fluorescence angiography, which is lacking from studies involving the once promising diagnostic tool of tri-phase bone scan, vascular, and fluorescence angiography may aid to the diagnosis and treatment of CRPS. Several proposed treatment modalities for CRPS exist, however evidence suggests that treatment options for CRPS are limited. Without a specific diagnostic test, diagnosis of CRPS is often delayed and patients are frequently subjected to worsening of the pain, condition and/or unnecessary surgery.[1,2] Subsequently, psychological and socioeconomic complications tend to arise in CRPS, including anxiety, causing depression, and social anxiety. These psychological, potentially deadly complications may be avoided if a diagnostic test for CRPS is verified, allowing for earlier diagnosis and subsequent treatment.

In conclusion, many questions remain about the diagnosis and treatment of CRPS, but our promising results indicated that fluorescence angiography may be useful in the diagnosis of CRPS. A few limitations exist in our study, including small patient population and all cases of CRPS being chronic. We recommend studies involving larger patient populations and including cases of acute CRPS. Although useful, optimal treatment and follow-up findings require research and additional studies are required to confirm the use of fluorescence angiography in CRPS.

References

6. Hernandez M, Perry D, Armstrong DG, Mills JL Jr. Early quantitative evaluation of peripheral vascular disease (PVD) and thus peripheral vascular labs such as doppler ultrasound are recommended to rule out PAD in the presence of these findings. It is thought that fluorescence angiography can be used to monitor the progress of the disorder following treatment of a sympathetic [1]. As an example, a sympathetic block and/or sympathetic nerve ablation may be performed in order to reduce sympathetic activity and thus improve perfusion to the affected extremity. This procedure is typically performed with the aid of a fluoroscopic guide wire and may be repeated several times in order to achieve adequate reduction in sympathectomy.