



## ■ REVIEW ARTICLE

# Complex regional pain syndrome with special emphasis on the knee

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**Complex regional pain syndrome is characterised by an exaggerated response to injury in a limb with intense prolonged pain, vasomotor disturbance, delayed functional recovery and trophic changes. This review describes the current knowledge of the condition and outlines the methods of treatment available with particular emphasis on the knee.**

### Historical considerations

Complex regional pain syndrome has had many synonyms over the years, including causalgia, Sudeck's atrophy, post-traumatic dystrophy, shoulder-hand syndrome, algodystrophy, algoneurodystrophy, reflex neurovascular dystrophy and reflex sympathetic dystrophy, reflecting the confusion surrounding this condition. Latterly, the disorder has been termed complex regional pain syndrome types I and II by the International Association for the Study of Pain.<sup>1,2</sup> The condition was noted by Sir James Paget (1814-1899) who described aspects of causalgia<sup>3</sup> and later by Mitchell et al,<sup>3</sup> and Schutzer and Gossling.<sup>4</sup> In 1900, Sudeck<sup>5</sup> described a troublesome painful condition in a limb, associated with swelling, stiffness and vasomotor instability after trauma.

### Definition

A simple and comprehensive definition has been presented by Schutzer and Gossling,<sup>4</sup> which describes an exaggerated response to injury of a limb, manifested by intense prolonged pain, vasomotor disturbances, delayed functional recovery and trophic changes.

The various terminologies describing this condition have been encompassed by the International Association for the Study of Pain<sup>1,2</sup> into a single term, complex regional pain syndrome, to accommodate the various presentations, postulated pathophysiology and anatomical distribution. The syndrome is said to be present when a noxious stimulus, which may be minor, causes an excessive response, with regional pain and sensory changes associated with the findings of a sympathetic dis-

order, manifested by changes in temperature, discoloration of the skin, swelling and sudomotor activity.<sup>6</sup> Trophic changes occur in the skin, nails and bone. Motor changes may present as impaired voluntary movements, fine or coarse tremors and dystonic posturing or movements.

Two types of complex regional pain syndrome have been recognised.<sup>1,2,6</sup> Type I is not associated with a specific nerve injury and does not follow the anatomical distribution of a peripheral nerve. Type II, although having a similar group of symptoms and signs to those of type I, is associated with a specific nerve injury and probably correlates with the syndromes previously termed causalgia.<sup>1,2,6</sup>

Although complex regional pain syndrome occurs in both the upper and lower limbs, response to treatment in the latter is less favourable, which has led to the suggestion that it is a discrete entity of the lower limb.<sup>7</sup>

### Pathophysiology

The definite aetiology of complex regional pain syndrome is unclear and many theories have been postulated.

1) It has been suggested that there is an abnormal increase in the activity of the sympathetic nervous system after a stimulus.<sup>6-9</sup> This may be a result of increased activity in the nerves, failure to modify the response centrally, perhaps due to reduced sensory input from the injured limb, or an increase in the peripheral catecholamine receptor sensitivity or injury-mediated hypersensitivity at the target organs to sympathetic discharge.<sup>6-9</sup>

2) Formation of artificial synapses may occur between nerve fibres in the dorsal-root ganglion after a peripheral injury with result-

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