

## Pain symptoms accompanying chronic post sternotomy pain

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### Purpose

The incidence of chronic post sternotomy pain (CPSP) is about 30%. Intercostal nerve damage with development of neuropathic pain is considered the main cause, although no therapy has been shown to reduce the incidence of chronic pain.

The incidence and etiology of painful sites unrelated to the chest wall incision (neck, shoulder, arms, back) has been poorly evaluated and are considered a separate post surgical complication.

This study was designed to evaluate all pain symptoms accompanying CPSP. Our hypothesis was that all pain symptoms post sternotomy were part of a united pain syndrome.

### Method

A questionnaire was sent to 1097 adult patients who underwent open heart surgery via median sternotomy at the Leiden University Medical Centre between January 1 2004 and January 1 2006. All 228 patients that stated to have sternal pain on the questionnaire were invited. An unmatched random sample of 120 patients without anamnestic sternal pain was drawn from the database as a control group by 1:2 randomisation.

All patients were examined at random and the investigator was blinded to the subjects history. The classification of the patient into the sternal pain or no sternal pain group in this study was based on the presence of pain during physical examination. Sternal pain was differentiated in 'spontaneous pain' and 'evoked pain' (pain upon palpation of the sternum).

### Results

Following the questionnaire, the incidence of anamnestic sternal pain was 36% (228 patients). 57% reported to have at least moderate pain (VAS >4). 277 patients underwent a standardized physical examination. Demographic parameters were comparable in the sternal pain group and no-sternal pain group, except for gender. Significantly more female patients were included in the sternal pain group. Mean postoperative time was 19 months. Mean age was 63 years. All patients with anamnestic pain during the hospital visit, had a painful sternum on palpation. 35 patients had a tender sternum upon palpation which they had not been aware of. These patients were included in the sternal pain group (evoked pain). The incidence of pain of head (33%), neck (33%), shoulder (45%), between the scapulae (38%), chest wall (22%) and arms (21%) was high and significantly more common in patients with sternal pain, both in the spontaneous and evoked pain group. Numbness of the chest wall was not related to the presence of a painful sternum. Muscular hyperalgesia, defined as pain on palpation of muscle, was found significantly more frequent in all palpated muscles in head, neck, chest and upper extremities of the sternal pain group. Anterior low cervical disc palpation was painful in 39 cases (20%) with sternal pain. In 87% of cases only part of the sternum was painful.

### Conclusions

The results of this study show that CPSP is an extensive and complex pain syndrome which includes, alongside sternal pain, pain of the musculoskeletal components of the trunk, upper extremity, head and neck. In patients without a tender sternum, other pain symptoms were rarely seen.