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# Outcomes Following Dynamic Compression Bracing for Pectus Carinatum

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**Describe role of Submitting/Presenting Trainee in this project (limit 150 words):**

Pediatric Surgical Scholar (research fellow in department of surgery) and primary author

## **Background, Objectives/Goal, Methods/Design, Results, Conclusions limited to 500 words**

### **Background:**

Pectus Carinatum (PC) is a chest wall deformity resulting in anterior protrusion of the chest. Some patients experience shortness of breath and chest pain, and they are particularly vulnerable to the psychosocial effects of poor body image and low self-esteem. Non-operative treatment of PC with orthotic bracing has been shown to be effective in PC correction. However, there are limited studies describing patient outcomes after achieving correction with bracing. We describe our experience with dynamic compression bracing (DCB) for patients who reached retainer mode and their satisfaction with bracing.

### **Objectives/Goal:**

To describe our institutional experience with DCB for PC and determine time to retainer mode with our protocol, as well as determine limitations and motivations for brace wear and patient satisfaction with bracing.

### **Methods/Design:**

We reviewed a prospectively collected data of PC patients who underwent DCB from July 2011-June 2018 at our institution. We included those who initiated bracing between 10 and 18 years of age and had at least four months of follow-up. Data were analyzed for those who achieved correction and entered retainer mode, defined by a correction pressure of < 1 psi. A telephone survey was conducted regarding ongoing brace use, self-reported recurrence, limitations and

motivations for brace use, whether they thought DCB was worthwhile, and overall satisfaction with the outcome of correction on a 1-10 scale.

**Results:**

Of the 460 patients who met inclusion criteria, 144 (31%) reached retainer mode. Nine percent were female and 91% were male. Median age at bracing was 14 years (IQR 13, 15). Median carinatum height was 2cm (IQR 1.5, 3), with a median initial correction pressure (PIC) of 3.7psi (IQR 2.9, 4.6). Median time to retainer was 5.5 months (IQR 3, 10). 57% of patients were compliant with brace wear as instructed. There was no statistically significant relationship between median PIC or carinatum height and time to retainer mode ( $p = 0.08$  and  $p = 0.10$ , respectively). Complications of bracing included skin erythema or acne (14%), problems with fit (14%), mechanical problems with the brace (8%) and rib flaring (5%). 63% had no complications. For compliant patients, median time to retainer mode was significantly shorter (3.5 mo. (IQR 2, 6) versus 10 mo. (IQR 6, 13),  $p < 0.001$ ).

Of the 137 patients contacted, 72 (53%) responded to the telephone survey. Median time to survey was 13 months (IQR 3, 33) after the last clinic visit. Barriers to compliance included discomfort (37%), embarrassment (13%), both (7%), and mechanical failure (1%). However, 42% reported no limitations. Motivations for compliance included appearance (58%), physiologic symptoms (21%), and parental influence (7%). All endorsed that the bracing process was worthwhile with 94% reporting a satisfaction rating of 8 or greater for the outcome of correction.

**Conclusions:**

DCB for PC is effective in earlier achievement of correction in compliant patients compared to non-compliant patients. Regardless of time to retainer mode, patients reported high satisfaction with bracing.