Yurvati Procedure: An Update

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Abstract

In the context of thoracic injury, a myriad of conditions cause post-operative pain complicating patient-recovery. ***Our clinical investigation suggested the hypothesis that Xiphoidynia is manageable via xiphoidectomy (Yuravti Procedure).*** We diagnosed patients via standard structural osteopathic palpatory techniques to determine pre-interventional pain scores, and then reassessed post-xiphoidectomy with corresponding pain scores. This yielded a positive correlation in the significant reduction in pain post-xiphoidectomy in patients presenting with Xiphoidynia.

Introduction

Xiphoidynia is a medical condition that manifests as recurrent and debilitating severe recurrent epigastric or sternal chest pain associated with: nausea, vomiting, and radiation of pain to the back, shoulders, arms, neck, and chest wall with palpation of the xiphoid process, breathing, or abdominal musculature usage. This is a sparsely-reported, yet common manifestation post-thoracic cage injury. The scientific literature surrounding the topic of Xiphoidynia and subsequent Xiphoidectomy, "the Yurvati Procedure," yields limited investigation despite the commonality of the condition clinically. The first report on the topic of Xiphoidynia was published in the New England Journal of Medicine over 67 years ago (Lipkin, 1955). Lipkin reported a cohort of 24 patients that presented with Xiphoidynia, yet none were treated surgically. He also reported that this issue is prevalent in nearly 2% of the population. Our presentation comprises the largest case series of patients treated for severe Xiphoidynia via surgical management by complete xiphoid resection. This presentation provides additional value to the world of osteopathic surgery in that the standard operating procedure implemented an emphasis on pre-operative standard structural osteopathic palpatory examination. The confirmatory osteopathic assessment being followed by complete Xiphoidectomy.

Methods & Results

Methods: Patients were routinely diagnosed via standard structural osteopathic palpatory techniques to determine pre-interventional pain scores, and reassessed post-xiphoidectomy with corresponding pain scores. Statistical analysis of pre- and post- operative pain scale comparison was completed via a nonparametric Mann-Whitney *U*-test.

Results: 96 patients diagnosed with Xiphoidynia were enrolled (61 male, 35 female) with age-range distribution from 14 to 73 (mean age 27 ± 6.5 years). The most common risk factors were sports injuries, motor vehicle crashes, and prior laparoscopic procedures. All patients exhibited Xiphoidynia symptomology for >2 years prior to enrollment. Standard 0-to-10 pain scaling (0 = no pain, 10 = worst pain) was used to assess patient-status pre- and post- operatively (4 weeks and 6 weeks) yielded mean pre-operative scores of 9.0, 4-week mean post-operative scores of 4.0 ($p>0.001$), and 6-week mean post-operative scores of 2.0 ($p>0.001$). All patients demonstrated significant improvement post-operatively at 4 and 6 weeks. See Graph 1 below for pain scores pre-operative, 4-weeks post-operative, and 6-weeks post-operatively.

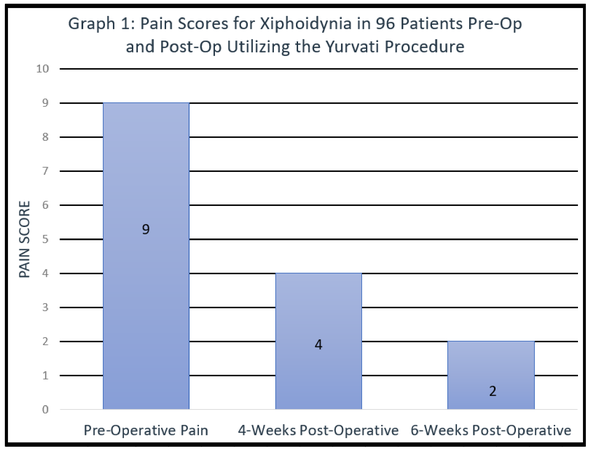

Table 1: Anatomical Considerations of the Xiphoid Process

Anatomical Orientation	Attachment	Local Innervation
Anterior	Linea Alba (Rectus Abdominus)	Intercostal nn.
Lateral	Aponeurosis of External Oblique, Internal Oblique, and Transverse Abdominus	Intercostal nn., Iliohypogastric nn. (L1), Ilioinguinal nn. (L1)
Posterior	Diaphragm	Phrenic n. (C3, C4, C5)

Discussion

The symptomology of Xiphoidynia mimics abdominal and thoracic complaints common to dangerous pathologies such as myocardial infarction, and as such must be treated seriously. The referral of pain to the chest abdomen, neck, head, and upper extremity find etiology from an irritated xiphoid process (Simpson et al, 2007). The condition is frequently insidious in nature and onset, but may also trace to traumatic instigation. Traumatic scenarios involve acceleration and deceleration injuries, blunt force to the thoracic cage, downward vector forces (such as lifting and obesity), and sports. Determining the presence of Xiphoidynia requires the exclusion of diagnoses such as the aforementioned, and also angina, pericarditis, or inflammatory disorders. Via exclusion, standard osteopathic palpatory diagnosis can be utilized to reproduce the presentation of the irritated xiphoid tissues and attachments. During development, the xiphoid process ossifies, making its connections to local structures largely immobile. Mechanical stress on these attachments affects the diaphragm, regional innervation, and lymphatics (See Table 1).

Yurvati Procedure

The approach is anterior to the xiphoid process, incisions are limited to 6cm. Electrocautery is used to divide soft tissues and xiphoid muscle attachments. Bridging veins are ligated/clipped for hemostasis. The xiphoid is isolated, a Kocher clamp grasps the xiphoid process, and electrocautery separates the xiphoid from the sternum. Wound closure is multi-layered in fashion with 2-0 non-absorbable sutures for the muscle-fascial layer, and 3-0 absorbable suture for the sub-cutaneous layer. Skin is approximated with a 4-0 absorbable suture. Sterile dressings cover the incision. Patients observed for 24h and discharged.

Conclusion

There was significant reduction in pain post-xiphoidectomy in patients presenting with Xiphoidynia of >2-years duration. The severity of the Xiphoidynia may have prognostic significance in this population. This cohort of 96 patients suggests that Xiphoidectomy is an effective operative treatment modality in the context of severe Xiphoidynia resistant to conservative management such as, observation and localized injections. However, it remains of utmost importance to exclude medical pathologies that are similar in presentation to the symptoms of Xiphoidynia, and to perform a thorough physical exam. The Yurvati Procedure has been shown to provide curative effects resulting in an improvement in the quality of life in patients suffering from the disabling Xiphoidynia (Yurvati, 2018). This procedure should be studied further.

References

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