

# Hernia of the Superior Lumbar Triangle

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LUMBAR hernias are rare. DeGarangeot<sup>10</sup> reported the first known case in 1731, the hernia being reduced at autopsy; Petit, in 1783,<sup>37</sup> described a strangulated hernia emerging through the inferior lumbar triangle which now bears his name; and in 1750, Ravaton<sup>37</sup> reported a strangulated lumbar hernia with operation and cure. A century later, Grynfeldt<sup>16</sup> described a hernia through the superior lumbar triangle, distinguishing it from the inferior lumbar triangle. In 1870, Lesshaft<sup>24</sup> independently confirmed the existence of a separate superior lumbar triangle and reported a similar case. By 1890, Macready<sup>25</sup> had collected 25 cases, two of which were through the superior lumbar triangle which was named the space of Grynfeldt-Lesshaft. In 1925, Virgilio<sup>38</sup> collected 109 cases and found that the Grynfeldt-Lesshaft hernia was more frequent than the Petit's hernia.

## Anatomy

A lumbar hernia may occur anywhere in the lumbar region which is bounded above by the 12th rib, below by the crest of the ilium, in front by a line drawn vertically downward from the anterior extremity of the 12th rib to the crest of the ilium, and behind by the vertebral column and the erector spinae muscles. The two main areas of lumbar herniation are the superior lumbar triangle (Grynfeldt-Lesshaft) and the inferior lumbar triangle (Petit).

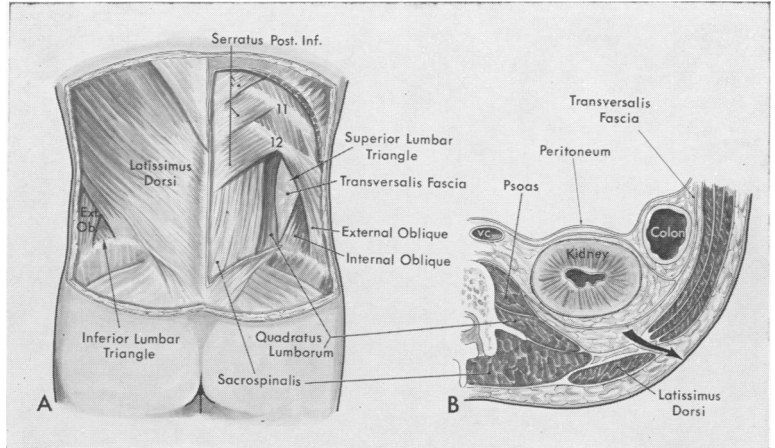
Goodman and Speese,<sup>15</sup> in dissections of 76 cadavers, found the superior lumbar triangle present in greater than 93 per cent of the specimens. To expose the "triangle," which sometimes takes a quadrilateral, del-

toid, trapezoid, or polyhedral shape,<sup>37</sup> one must retract both the latissimus dorsi and the serratus posterior inferior muscles. If a triangle is present, it is inverted, the base being formed by the lower border of the 12th rib and the portions of the serratus posterior inferior. The anterior border is formed by the internal oblique and the posterior border is the quadratus lumborum; these borders are easily remembered if the area is thought of as the lumbocosto-abdominal triangle.<sup>27</sup> The floor of the triangle is the transversalis fascia which is a portion of the fusions of the lumbodorsal fascia which continues anteriorly as the aponeurosis of the transversus abdominis muscle and posteriorly splits into three layers which include the quadratus lumborum and the sacrospinalis.

The size and shape of the space depend upon the development of the bordering muscle masses, the length and position of the 12th rib and the position of its muscle attachments, and the position of attachment of the overlying latissimus dorsi. Weak points in the superior lumbar triangle are immediately beneath the 12th rib where the transversalis fascia is not covered by the external oblique and where it is perforated by the 12th dorsal intercostal neurovascular bundle.<sup>27</sup>

The inferior lumbar triangle is normally present in adults, occasionally present in children. It is usually triangular shaped with the base being the iliac crest. The posterior border is the free edge of the latissimus dorsi and the anterior border is the external oblique. The musculofascial floor is much stronger than that of the superior lumbar triangle, being composed of

FIG. 1. A. Anatomical relationships of the inferior and superior triangles. A portion of the latissimus dorsi has been removed to fully expose the deeper superior lumbar triangle. B. Transverse section through kidney inferior to 12th rib.



the lumbodorsal fascia with underlying internal oblique and transversus abdominis. The superior lumbar triangle is larger and more constant than the inferior lumbar triangle, possibly accounting for the greater frequency of hernias in this area.

### Case Report

R. D., a 47-year-old man, was admitted to the Nashville Veterans Administration Hospital with a chief complaint of a "knot" in his side of 3 to 4 weeks' duration. The mass first appeared after he had strained himself while loading heavy boxes onto a truck. The mass was painful and enlarging. His bowel habits had remained unchanged and he had no other abdominal pain.

On examination, there was a 3 × 3 cm. round, smooth, soft mass in the posterior axillary line immediately beneath the 12th rib on the right side. No bowel sounds were heard over the mass which was slightly tender, not increased in temperature, could not be totally circumscribed by the examiner's fingers, and was easily reducible. A transmitted impulse could be felt in the mass when the patient coughed.

The laboratory values and radiographic examinations were normal.

Under endotracheal anesthesia, the patient was placed in the left lateral decubitus position and the operating table was angulated to achieve the same effect as a kidney rest. The mass which had been marked with indelible ink preoperatively could not be palpated with the patient in this position. An incision was made over the mass paralleling the intercostal nerves. When the latissimus dorsi was retracted medially, a 3 × 5 cm. mass of herniated fat was sharply dissected to expose its incarcerated neck caught in a 1 cm. de-

fect immediately beneath the 12th rib. High ligation was performed with 2-0 silk, and the defect in the transversalis fascia was closed with interrupted Mersilene sutures. The fascia of the internal oblique, quadratus lumborum, and serratus posterior were imbricated. A pressure dressing was firmly applied. The postoperative course was smooth and sutures were removed on the 7th postoperative day. Six months postoperatively the patient is asymptomatic and engaged in heavy work.

### Discussion

Twenty per cent of reported lumbar hernias are *congenital*. These are rarely bilateral and are usually associated with other congenital abnormalities.<sup>1, 4, 6, 11, 14, 23</sup>

All congenital hernias reported have been through the inferior lumbar triangle.

*Acquired traumatic lumbar hernias* comprise about 26 per cent of reported lumbar hernias and are probably more frequent in the superior lumbar triangle because of operations performed in this area and because it is the thinnest point in the lateral and posterior abdominal wall. This hernia results from direct trauma, penetrating wound, abscess, or flank incision.<sup>27</sup> Massive lumbar hernias have been reported following removal of bone from the iliac crest for autogenous bone grafting.<sup>3, 28</sup> Kretschmer<sup>20</sup> reported 13 renal hernias through lumbar triangles, in 11 of which prior renal operations had been performed, and of the other two, one was a true congenital

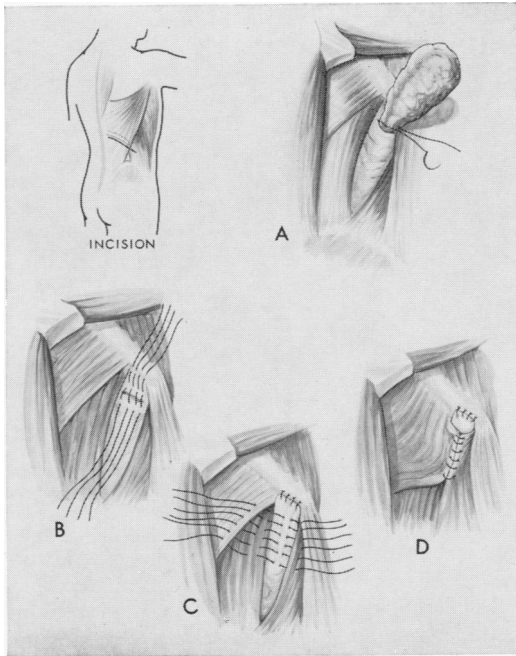


FIG. 2. Incision may be either oblique as shown or vertical for adequate exposure. A. Identification of defect and ligation of fat-containing sac after inspection of contents. B. Closure of defect utilizing periosteum of 12th rib. C, D. Obliteration of triangle with internal oblique, serratus posterior inferior and quadratus lumborum.

renal hernia through the inferior lumbar triangle, the other was the aftermath of goring by a bull.

*Spontaneous lumbar hernias* constitute about 54 per cent of the reported cases. Such predisposing factors as age, emaciation, and debilitating disease may be contributing factors since loss of fat which normally pads the neurovascular orifices (found only in superior lumbar triangle) facilitates the rupture.<sup>35</sup> Watson found 8 per cent of 186 lumbar hernias were strangulated, the majority of these being spontaneous hernia following lifting.<sup>37</sup>

Although most authors believe that a sac is present most of the time, statistics are lacking. Marmisse<sup>26</sup> described fatty hernias without sacs as early as 1862. The most frequently reported contents of the hernias are omentum, small intestine, colon, kidney, stomach, ovary, spleen, and appendix.<sup>27</sup>

Symptoms of an uncomplicated lumbar

hernia are rare, but occasionally heaviness in the flank or back is associated with back pain. Frazer<sup>13</sup> described his own lumbar pain which persisted for 6 years after an automobile accident. After extensive examinations, lumbar herniorrhaphy was performed with complete relief of symptoms. Several reports<sup>2, 7, 8, 9, 12, 19, 31, 34</sup> emphasize the necessity to exclude lumbar hernia as a cause of back pain. Most instances were not hernias through either of the lumbar triangles but were small adipose hernias through superficial fascial layers.

Most authors agree that once formed, these hernias progressively enlarge until they either cause symptoms or attain enormous proportion.<sup>27</sup> All lumbar hernias should be repaired except in the poor risk patient. Lee and Mattheis<sup>23</sup> advise waiting until after the age of 6 months to repair hernias in children.

A strong overlapping reconstruction, employing intrinsic fascia and aponeurosis, is preferable to artificial splints such as tantalum mesh or skin. Upper gastrointestinal and barium enema roentgenograms, bowel preparation with mechanical cleansing, and weight reduction preoperatively are recommended. A kidney rest is utilized to increase the distance between the 12th rib and iliac crest, and the entire buttock and thigh are prepared to the knee in case a flap of gluteus maximus fascia or fascia lata is required.<sup>27</sup> Langan<sup>22</sup> emphasized the helpfulness of marking the hernia with an indelible marker preoperatively.

The objectives of operation for hernia are to reduce the hernia, to remove the sac if it is large or simply reduce it within the hernial ring if the sac is small, and to reconstruct the defect.<sup>32</sup> In lumbar hernias, a sac is rarely adherent to the skin, being separated from it by either fat or muscle. The sac should be identified, the neck dissected, and if the content of the sac is peritoneal or perirenal fat, its pedicle is ligated and the mass excised.<sup>27</sup>

Reconstruction of the defect may be accomplished in a variety of ways. The ana-

tomical arrangement in the superior lumbar triangle and the usual small defect lend themselves to simple closure with interrupted sutures and overlapping of the adjacent fascial structures. If the defect is large, multiple fascial flaps reinforced by some type of artificial splint may be necessary. Several methods are available for the reconstruction of hernia of the inferior lumbar triangle and are described elsewhere.<sup>3, 5, 11, 17, 18, 21, 29, 30, 33, 37</sup>

### Summary

Lumbar hernias are rare; scattered reports of hernias of both superior and inferior lumbar triangles have appeared in both the English and foreign literature since the collection of 186 cases in 1948 reported by Watson,<sup>37</sup> the total now being about 220. Hernia of the superior lumbar triangle is most commonly associated with either straining or direct trauma in the lumbar region. The diagnosis is relatively easy if there is a reducible mass beneath the 12th rib which transmits a cough impulse. An additional case of spontaneous hernia of the superior lumbar triangle with a method of successful repair is reported.

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