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Further Modified Taylor Retractor for Spinal Surgery

Omurga Cerrahisi İçin Daha İleri Modifiye Edilmiş Taylor Retraktörü

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ABSTRACT

New techniques have minimized the incision length and thus required modifications of surgical instruments. The Taylor retractor is one of these instruments. We therefore designed several modifications of the classical Taylor retractor. The following structural modifications were made on the classical Taylor retractor: First, we provided detachable blades with three different lengths (60, 70, 80 mm). Second, we breached a slit wide enough to let the intervertebral disc rongeurs to nestle down in it. Third, instead of a single sharp tip at the end of the blade, an arched blade that had two smooth tips was designed. Adjustable blades allowed placing the retractor just on the skin without any space between the retractor and skin by sliding the retractor over its blade downwards, thus providing a low-profile surgical retraction. The slit facilitated reaching the other side of the disc by leaning against the retractor. Pressing slightly and lowering the retractor subsided the skin and the paravertebral muscle, consequently facilitated motion of rongeurs and provided better exposure owing to low profile retraction. The arched blade with two tips served better placement with less traumatization at the facet joint. The relevant modifications facilitated the surgical procedure. We believe one retractor with adjustable blades is enough for more comfortable surgery at any depth.

KEYWORDS: Lomber disk hernisi, Mikrodiskektomi, Retraktör, Taylor

ÖZ

Yeni cerrahi tekniklerin kullanması ile beraber cerrahi kesi alanları daha da küçüldü, bu da birçok cerrahi donanımda değişiklikler yapılmasını gerektirdi. Taylor retraktörü de bunlardan birisidir. Biz de klasik Taylor retraktöründe bazı değişiklikler yaptık. Öncelikle Taylor retröktörünün ucuna takılıp çıkarılabilen üç ayrı boyda (60,70,80 mm) parça tasarladık. İkinci olarak Taylor retraktörünün 90 derecelik köşesinde intervertebral disk Roungeurunun sığacağı yarık oluşturuldu. Üçüncü olarak, retraktörün ucuna yay bicimi verilerek tek bir sivri çıkıntı yerine bir arkın iki ucunda hafif çıkıntılar yapıldı. Çıkarılabilir ve ayarlanabilir retraktör bıçakları sayesinde retraktör aşağıya bastırılarak bıçak üzerinde kaydırıldı. Böylece retraktörün sapının cilde oturmasıyla düşük profilli bir retraksiyon sağlandı. Düşük profilli cerrahi retraksiyon cilt seviyesinin de cerrahi saha kenarında daha alçakta kalmasını sağladı ve cerrahi aletlere daha geniş hareket serbestisi kazandırıldı. Cerrahi sahada görüş sahasının da iyileştiği izlendi. Bıçak ucundaki arklı kısım sayesinde faset eklemi dışında doku daha az zedelenerek yumuşak ekartasyon sağlandı. Taylor retraktördeki tüm bu değişiklikler sayesinde, profili düşürülmüş dış cerrahi duvar ve geniş görüş sahası içinde cerrah için ameliyatın konforunun arttığı izlendi. Ayarlanabilir ve bıçakları değiştirilebilir bir tek Taylor retraktörünün herhangi derinlikteki cerrahi sahada çalışmayı daha konforlu hale getireceği değerlendirilmiştir.

ANAHTAR SÖZCÜKLER: Lumbar disc herniation, Microdiscectomy, Retractor, Taylor

INTRODUCTION

The application of microsurgical techniques to spinal surgery has become an accepted means of treating symptomatic disc herniations. New techniques have minimized the incision length and evolvements in minimal invasive surgical procedures have caused a swing to chemonucleolysis and endoscopic discectomy, but these could not supplant microdiscectomy that has been widely performed for years (5,6). However, the use of better instruments and the introduction of the operation microscopes have undermined classical approaches. Thus microdiscectomy via smaller incisions has become the procedure of choice. Many standard operations have been refined and new manipulations have been developed for inaccessible areas. As surgeons got more familiar to microscopes, lumbar microdiscectomy with smaller incisions has become the preponderant surgical option, because it promised earlier discharge from the hospital, a more comfortable postoperative course and return to work at an earlier date (3). Adept surgeons preferred smaller incisions. This required some modifications of the present surgical instruments such as the Taylor retractor that has been commercially available for half a century and has been used by many surgeons.

METHODS and TECHNICAL DEVELOPMENT

Demands for handier retractors used in spinal surgery incited us to design several modifications on the classical Taylor retractor. First, we provided detachable blades with three different lengths (60, 70, 80 mm) (Figure 1). They were also given a curve with a radius of 25 cm (Figure 2). Second, we breached a slit wide enough to let the intervertebral disc

rongeurs to nestle down in it. Third, instead of a single sharp tip at the end of the blade, an arched blade that had two smooth tips was designed.

Detachable blades allowed the opportunity to select the suitable size. Further adjusting to the appropriate depth was possible. Moreover, placing the retractor just on the skin without any space between the retractor and skin by sliding the retractor downwards over the adjustable blade became possible. This provided a low-profiled lateral wall of the operation field. Together with the slit at the beveled corner of the retractor that enabled reaching the other side of the disc by leaning against the retractor served better. The curve of the blade provided extra lateral retraction so as to visualize facet joint clearly. Pressing slightly and lowering the retractor on its blade further subsided the skin and the paravertebral muscle, consequently increased the motion range of the rongeurs and provided better exposure (Figure 3). The double-tipped blade preserved facet joint and alleviated hemorrhage that might occur after the removal of the retractor (Figure 1).

DISCUSSION

Contrary to the available retractors that needlessly traumatize the lumbar interspinous ligament, slip out of position and consequently cause partial obstruction of the view of the operating microscope, the Taylor retractor facilitates the operation. It is a facet-fulcrum retractor and is inserted in the wound. The tip of the retractor is placed at the lateral margin of the facet joint or its junction with the pedicle subject to exploration (1,4). Thus the retractor acts as a second-level lever. The fulcrum is at one end, force is at the other end and power is exerted in the middle of the retractor. This commendable retractor enables the retraction of the paravertebral musculature and skin without counter-traction of the midline structures. Handier retractors produced by some changes on the sizes of the Taylor retractor justified its usefulness. In 1984, Bell and Lavyne introduced a modified retractor that was the same as Taylor's but the blade was narrowed to half the width of the original one. The new retractor was 1.5 cm in width and its tip was sharper (1). Later on in 1990, Epstein proposed further modifying and minifying the long and short retractors

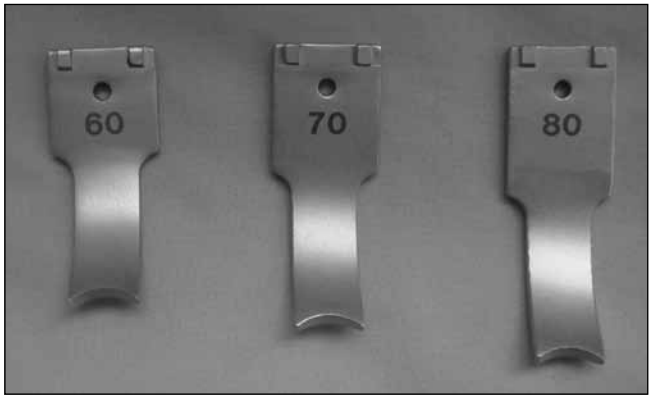

Figure 1: Three sizes of detachable blades with arched ends are seen. They are 11.2 cm in width.

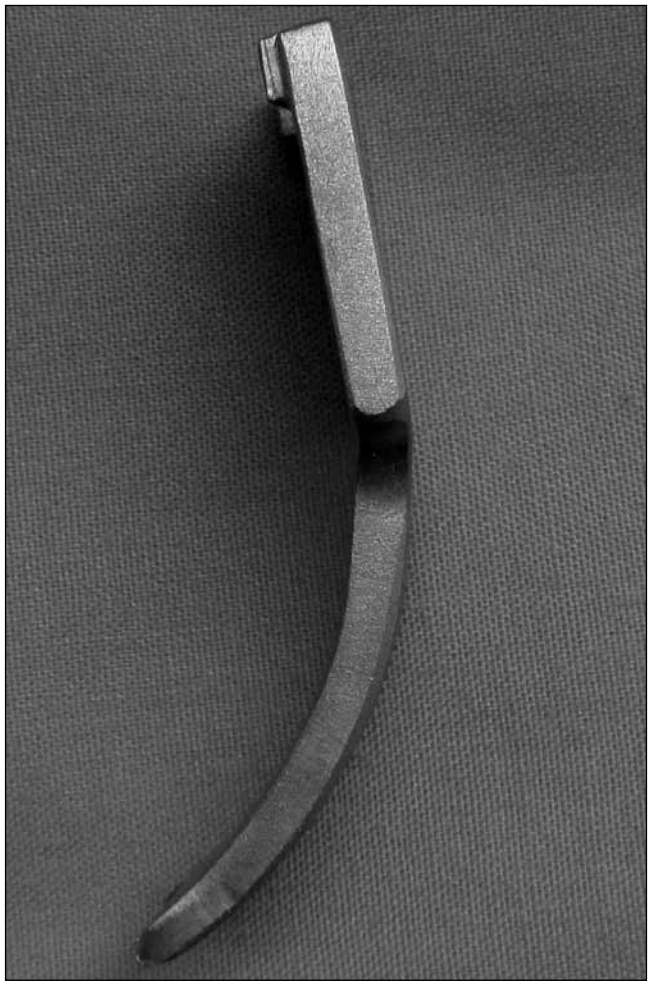

Figure 2: The blades were curved so as to have a radius of 25 cm and we obtained extra lateral retraction.

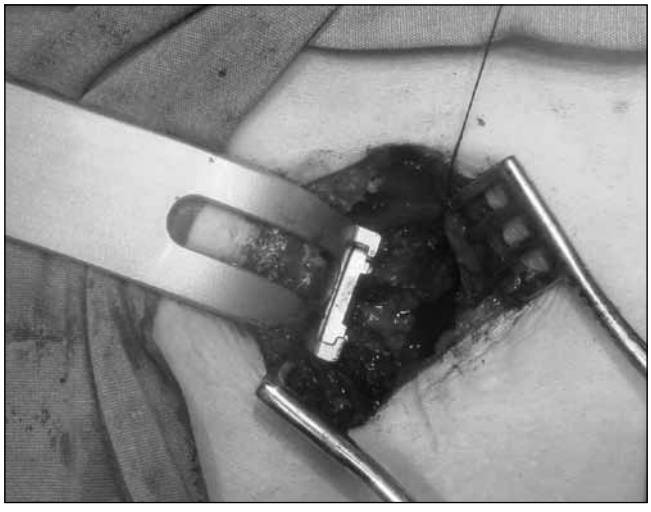

Figure 3: The blade with the appropriate length for the patient is placed into its mount. The retractor has a slot that can nestle intervertebral disc rongeurs providing a larger range of motion. It is also pressed slightly downwards so that the space between the instrument and skin is obviated. Furthermore, the skin under the retractor may subside to some extent allowing better exposure.

of Taylor in a fashion similar to that of Bell and Lavyne (2). Though several sizes of the retractors have been available, the ordinary retractors have fallen short of expectations in some cases. Smaller incisions with Taylor retractors of inappropriate length for the individual patient outcropped difficulty in handling surgical instruments. In some individual variations of depth in surgical field, the surgeon had to contend with the blade of the retractor that sometimes obstructed the view and prevented free movement of surgical instruments. We found that using the retractor with the modifications we have proposed provided better anatomic exposure through the same incision. The surgeon should be careful because the leverage exerts a powerful force and the paravertebral muscles may sustain unnecessary pressure necrosis if it is maintained too strenuously and for too long a time. The sliding blade of the retractor mostly prevents that undesired complication. The curve of the blade retracted soft tissues extra lateral to the facet joint and the space gained was suitable even for transpedicular screwing with ease. Furthermore, the range of movement of the surgical instruments was much better. Making use of the slit at the beveled corner of the retractor, it was easier to reach the opposite side disc material with Rongeurs.

CONCLUSIONS

The arched smooth end of the blade alleviates hemorrhage at the site where the retractor has been inserted and provides efficient lateral retraction. We found that the use of the Taylor retractor with the depicted modifications facilitated the surgical procedure with an unobstructed view of the field and the subsided lateral wall allowed a maximum range of motion for the surgical instruments. We believe only one retractor with adjustable blades is enough for more comfortable surgical with an operation field of any depth.

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