INCIDENTAL DUROTOMY DURING DEGENERATIVE LUMBAR SPINE SURGERY: INCIDENCE AND RISK FACTORS

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ABSTRACT

Objective: To evaluate the incidence and risk factors of incidental durotomy during degenerative lumbar spine surgery.

Material and methods: This observational study was conducted in the Department of Neurosurgery Lady Reading Hospital Peshawar from January 2011 to December 2012 (2 years).There were 67 patients with incidental durotomy during degenerative lumbar spine surgery. We included those patients in our study, who undergone surgery for degenerative lumbar spine irrespective of the age and gender and excluded those who had some fusion procedure for the same disease or involved spine other than lumbar spine. The patients were observed for incidental durotomy and possible risk factors.

Results: We had total of 1176 patients who undergone surgery for degenerative lumbar spine of which 5.7% patients had incidental durotomy. There were 65.7% were males and 34.3% females with male / female ratio of 1.9: 1. It was more common in old age (47.8%), stenosis (4%), multiple level disease (3.1%) and those with redo surgeries.

Conclusion: We conclude from our study that the incidence of incidental durotomy during degenerative lumbar spine surgery is 5.7% and Risk factors are male sex, older age, stenosis, multiple level surgeries and redo surgery.

Key words: lumbar disc herniation, Spinal stenosis, Complication, Surgery, Outcome.

INTRODUCTION

Procedures for degenerative lumbar spine diseases are the most common operations on the spine. Incidental durotomy is a common and surgically important complication during these procedures[1]. These tears are usually the result of direct trauma or laceration, with the Kerrison punch being the instrument most commonly implicated[2,3]. When recognized intraoperatively, dural tears need to be made watertight to prevent cerebrospinal fluid (CSF) leaks[4, 5]. This is usually accomplished by direct suturing and/or the use of fibrin glue, in addition to muscle or fat graft to cover the area of the tear. If unrecognized however, these tears can have significant consequences, such as postoperative low pressure headache, CSF leakage and/or the development of fistulas or pseudomeningoceles[1, 5]. Incidental durotomy increase operative time, blood loss and inpatient stay. Surgical correction can be considered when there is no response to conservative therapy[6, 7].

Previous studies have reported prevalence of dural tears varying from 1 to 17% depending on diagnosis and type of surgery performed[8, 9]. Advance age, thin dura as seen in long standing stenosis, dural adhesion and fibrosis as in revision surgery and large disc herniation making dural retraction difficult are some of the risk factors for dural tears[10].

As local study on this topic is limited, this study will help us to know the incidence and risk factors of incidental durotomy during degenerative spine surgery and will help to prevent this complication.

MATERIAL AND METHODS

This observational study was conducted in the Department of Neurosurgery Lady Reading Hospital Peshawar from January 2011 to December 2012 (2 years). There were 67 patients with incidental durotomy during degenerative lumbar spine surgery. We included those patients in our study, who undergone surgery for degenerative lumbar spine irrespective of the age and gender and excluded those who had some fusion procedure for the same disease or involved spine other than lumbar spine. After taking approval from the ethical committee, Consent was taken from the patients or their relatives. The patients were observed for incidental durotomy and possible risk factors. The demographic and clinical data of the patients was entered in a specifically designed Performa. This data was analyzed using SPSS version 11.

RESULTS

We had total of 67 patients with incidental durotomy out of 1176 patients who undergone surgery for degenerative lumbar spine during 2 years study. Making 5.7% of the total.

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Age distribution:

Age of the patients ranged from 19 to 68 years with the mean age of 43.5 years.

Age range	No of durotomy patient	%age
Young (up to 25 years)	9	13.4
Middle (26-50years)	26	38.8
Old (>50 years)	32	47.8
Total	67	100

Gender of patients:

Out of 67 patients 44 (65.7%) were male and 23 (34.3%) female with male / female ratio of 1.9: 1.

Type of degenerative disease: out of 67 patients with incidental durotomy 47 (4% of the total) had spinal stenosis and 20 (1.7%) lumber disc herniation.

No of spinal levels: Those with single level lumbar spine surgery were 31 (2.6%) and multiple level 36 (3.1%).

Previous surgery:

In our study 39 (3.3%) patients had history of the same or adjacent level spinal surgery and 28 (2.4%) had 1st time spinal surgery.

DISCUSSION

Decompression is the usual treatment offered when surgery is indicated in degenerative lumbar spine. Incidental durotomy is an important complication observed. Previous studies have reported prevalence of dural tears varying from 1 to 17% depending on diagnosis and type of surgery performed[8, 9]. The incidence and risk factors for dural tear have been reported by several authors [5, 10.11.]

We operated on 1176 patients with degenerative lumbar spine and incidental durotomy was seen in 5.7 % cases. The results vary in different studies. In one of the study 6.8% patients suffered an accidental durotomy and the overall incidence of complications related to the durotomy was 18% [1]. Guerin P et al. reported that the incidence of incidental durotomy during spine surgery was 3.84% in patients who underwent spinal surgery at a single spine unit. They observed Fifty-one dural tears out of 11326 cases (3.84%) [12]. In another study a total of 799 patients underwent first-time lumbar discectomy. There was an incidental durotomy in 25 (3.1%) of these cases[13].

With the growth of the aged part of the population the number of elderly patients requiring spine surgery continues to increase[14-16]. In old age the strength and elasticity of the dura is reduced and it become more prone to tear. Also there are more chances of stenosis with aging. All this increases chances of dural tear during surgery. This was also reflected in our study and more of our patients (47.8%) with dural tear during surgery were in old age group.

We had 65.7 % male with incidental durotomy with the male female ratio of 1.9: 1. Fredrik and colleagues[17] reported that this complication is more common in female (56%) than males. In another study the incidence of dural tear was significantly higher in women (5.6%) than in men (3%) [18]. The exact reason for this difference in male and female ratio is not known.

With long standing compression as stenosis the dura is more susceptible to tear, this is because of the fact that dura becomes more thinner and less elastic and also the difficulties created by ligamentous hypertrophy and osteophytes on the facet joints in decompression. This was also observed in our study. We had 4% of the patients with incidental durotomy with spinal stenosis and 1.7% had simple herniation of disc without stenosis. Other studies have also comparable results. Incidence figures for dural lesions in disc surgeries seem to be in the region of 2–6% [17, 19] and 7.4% of decompressive operations for spinal stenosis[19]. large disc herniation making dural retraction andv nerve root dissection difficult are some of the risk factors for dural tears.

After surgical manipulation, the dura is adherent to the surrounding scars and safe dissection of the dura and nerve roost become very difficult in redo- surgeries. This was also noted in our patients that incidental durotomy was more common in those who had previous lumbar spine surgery at the same or adjacent spinal level. We had 3.3% patients with redo surgeries The reported incidence varies from 15.9% in revision surgery to 3.5% in primary lumbar discectomy [2,9,20]. In one study 19 % of the patients with dural tear had previous spinal surgery [17]. In another study by the same author it was reported that the incidence of dural lesions was 2.7% and in patients with previous disc surgery, the incidence was doubled, 5% [11].

The more levels of spinal surgeries the more chances of tissue trauma and dural tear. We had 36 (3.1%) patients with incidental durotomy in patients with multiple levels involved than 46.3% in patients with single level lumbar spine surgery. In a study Fredrik and colleagues[17] it was reported that the incidence of durotomy increased with number of levels decompressed from 5.1% in one-level decompression to 11.5% when four or more levels were decompressed. While other have opposite results.The reason for this different results is not obvious.Large disc herniation making dural retraction and nerve root dissection difficult also prone the patient to dural tears[2].

A minor dural lesion noted during surgery, adequately closed and treated with a day of bed rest postoperatively is no major issue but in the other end of the spectrum complication problems such as dural fistulas and cysts, meningitis, arachoiditis and epidural

abscesses can occur. However, there are some controversies regarding the long-term outcome after dural lesion exists.

CONCLUSIONS

We conclude from our study that the incidence of incidental durotomy during degenerative lumbar spine surgery is 5.7% and Risk factors are male sex, older age, stenosis, multiple level surgeries and redo surgery.

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