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POST SURGICAL LUMBAR SEGMENTAL INSTABILITY FOLLOWING LUMBAR SPINE SURGERY-DEMOGRPHICAL FACTORS ANALYSIS.

Neurosurgery

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KEYWORDS

INTRODUCTION:

Background: Lumbar disc disease is the most common cause of low back pain and sciatica. The lifetime incidence of sciatica ranges between 13 to 40%, and the annual incidence ranges from 1 to 5%.[1] The point prevalence of low back pain in adult general population was 12 to 33% and one year prevalence was 22 to 65%.[2] The life time prevalence of low back pain is 65 to 80%.[3] Low back pain is the leading cause of activity limitation and work absence throughout much of the world.[4] Lumbar disc herniation is one of the most common causes of low back pain. Prevalence of lumbar disc herniation is around 1 to 3% in Finland and Italy depending on the age and sex.[5]

Lumbar disc surgery is the most common surgery performed by neuro surgeons and orthopaedic surgeons. However not all the patients are successfully relieved of their symptoms after lumbar spine surgery. A subset of patients develops new or persistent pain after lumbar spine surgery. Persistence or recurrence of symptoms after lumbar spine surgery is also known as failed back surgery syndrome. The causes for failed back surgery syndrome are inappropriate patient selection, poor surgical decision making, poor operative techniques, extensive bony and ligamentous excision and post operative complications.

One of the common causes of failed back surgery syndrome is the development of post operative spinal instability.

Spinal instability is defined as the loss of ability of the spine under physiological loads to maintain its pattern of movement. Inter-vertebral joints provide mobility and stability. Disruption of inter-vertebral disc, facet, lamina and the ligaments alter the load bearing character of the spine. This increases the risk of instability. Even minor instability can cause strain in the components of motion segment leading to pain and muscle spasm. It leads to a very intriguing problem and is difficult to manage. Hence it is necessary to identify those patients who are likely to develop post operative spinal instability and to do prophylactic stabilization to avoid such complications.

There are many factors that could lead to postoperative lumbar spine segmental instability. Failure to notice the existing instability before surgery and ignoring the obvious factors which could lead to post operative lumbar spine segmental instability are the main causes of persistent back pain. The other major contributing factor is aggressive intra operative surgical bony, ligamentous and disc excision.

Many authors have tried to predict the development of post operative instability. Various contributing factors like age, disc height, facet angles and the amount of bone excision have been studied as contributory factors. However till date the contributing factors causing post operative lumbar spine segmental instability have not been identified clearly and discrepancies still exist. If the subset of patients who are likely to develop post operative instability could be identified beforehand, such patients can be stabilized during the initial surgery itself. This will avoid post operative instability and persistent back pain.

The aim of the present study is to analyse the various pre operative and intraoperative factors which could contribute post operative instability and to provide a predicting system which helps spinal surgeons in surgical decision making.

This study is justified because of the following reasons.

1. Post surgical lumbar spine segmental instability is a serious problem to the patient and to the surgeons. For the patient, the pain in the low back persists or worsens leading to disability and dissatisfaction. This affects the lifestyle, job, and productivity leading to dissatisfaction, psychological stress and affects the familial integrity.
2. For the surgeon, mental stress and dissatisfaction because of the failed back surgery syndrome. Second surgery will be technically demanding for the surgeon and most of the patients may not accept for the second surgery. If the development of post operative segmental instability could be predicted before the first surgery itself, then this problem can be avoided by doing stabilization procedures during the initial surgery itself.
3. Patients with persistent low back pain create significant social and economic burden. This includes both direct costs for further treatment, as well as indirect costs including loss of work, family role, loss of productivity and cost of care takers. A group of patients with persistent pain and disability may go for long leave from work leading to workers compensation and litigation.
4. At present there is no simple, reliable and organized system to evaluate the patients for lumbar spine surgery with respect to stabilization.
5. Formulation of a predictive system will help the surgeons to identify the subgroup of patients who will develop post operative instability and in surgical decision making.

AIMS & OBJECTIVES

1. To analyse the impact of factors like clinical, radiological, and the extent of surgical procedure etc, which could lead to post operative lumbar spine segmental instability.
2. To evaluate a scoring system for prediction of post operative segmental instability.
3. To perform prophylactic stabilization using the scoring system and evaluate the results of prophylactic surgery.

In this paper we have analysed the demographical factors of our study. The other factors will continue in our next paper.

OBSERVATION

Totally 142 patients were registered for the study. 2 patients developed discitis, 3 patients developed recurrent disc prolapse and 2 patients could not be followed. 135 patients were taken up for the final study.

Table 1 - Outcome in relation to sex

Gender	Description	Outcome		Total
		Good	Poor	
Male	Number of patients	67	11	78
	% within Outcome	57.8%	57.9%	57.8%
	% of Total	49.6%	8.1%	57.8%
Female	Number of patients	49	8	57
	% within Outcome	42.2%	42.1%	42.2%
	% of Total	36.3%	5.9%	42.2%
Total	Number of patients	116	19	135
	% within Outcome	100%	100%	100%
	% of Total	85.9%	14.1%	100%

Chi square = 0.000. P= 0.991, >0.05, Not significant.

Chart 1 - Pie chart showing male / female ratio

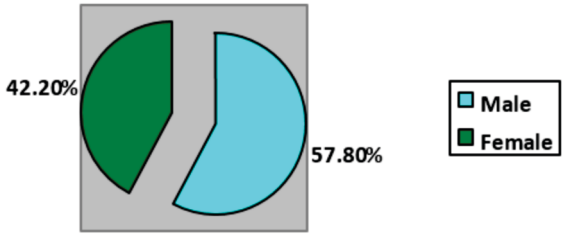


Chart 2 - Outcome in relation to sex

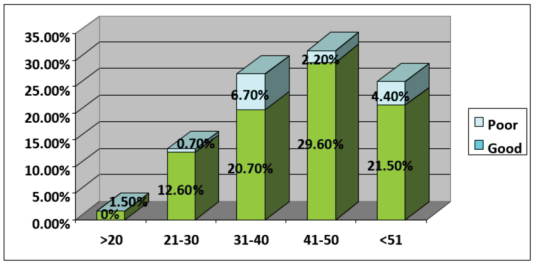
O f t he 135 patients there were 78 (57.8%) males and 57 (42.2%) female patients. Among the 19 (14.1%) poor outcome patients, 11 (8.1%) males and 8 (5.9%) females developed post operative instability. There is no statistical significance among the sex and post operative instability.

Table 2 - Outcome in relation to age

Age group years	Description	Outcome		Total
		Good	Poor	
< 20	Number of patients	2	0	2
	% within Outcome	1.7%	0%	1.5%
	% of Total	1.5%	0%	1.5%
21 – 30	Number of patients	17	1	18
	% within Outcome	14.7%	5.3%	13.3%
	% of Total	12.6%	0.7%	13.3%
31 – 40	Number of patients	28	9	37
	% within Outcome	24.1%	47.4%	27.4%
	% of Total	20.7%	6.7%	27.4%
41 – 50	Number of patients	40	3	43
	% within Outcome	34.5%	15.8%	31.9%
	% of Total	29.6%	2.2%	31.9%
51 <	Number of patients	29	6	35
	% within Outcome	25%	31.6%	25.9%
	% of Total	21.5%	4.4%	25.9%
Total	Number of patients	116	19	135
	% within Outcome	100%	100%	100%
	% of Total	85.9%	14.1%	100%

Chi square = 6.686. P=0.153. >0.05, Not significant

Chart 3 - Outcome in relation to the age



The age ranges from 18 to 68 years. The mean age was 43.3 years. 80 (59.3%), fall in the age group of 31-50 years. 20 patients (14.8%) were in the age group of less than 30 years. 35 patients (25.9%) fall into the age group of more than 50 years. Of the 135 patients, 19 patients (14.1%) developed post operative instability, who were in poor outcome group. Among them 1 patient (0.7%) was from the age group below 30 years, 12 patients (8.9%) were in the age group 31 to 50 years and 6 patients (4.4%) from the age group more than 50 years. For the patients less than 30 years of age the incidence was low and the surgical outcome was good.

Summary: OBSERVATION

Totally 142 patients were registered for the study. 2 patients developed discitis, 3 patients developed recurrent disc prolapse and 2 patients could not be followed. 135 patients were taken up for the final study. O f t he 135 patients there were 78 (57.8%) males and 57 (42.2%) female patients. Among the 19 (14.1%) poor outcome patients, 11 (8.1%) males and 8 (5.9%) females developed post operative instability. There is no statistical significance among the sex and post operative instability. The age ranges from 18 to 68 years. The mean age was 43.3 years. 80 (59.3%), fall in the age group of 31-50 years. 20 patients (14.8%) were in the age group of less than 30 years. 35 patients (25.9%) fall into the age group of more than 50 years. Of the 135 patients, 19 patients (14.1%) developed post operative instability, who were in poor outcome group. Among them 1 patient (0.7%) was from the age group below 30 years, 12 patients (8.9%) were in the age group 31 to 50 years and 6 patients (4.4%) from the age group more than 50 years. For the patients less than 30 years of age the incidence was low and the surgical outcome was good. Of the 135 patients, 31 (23%) had sedentary life style, 76 (56.3%) were moderate manual workers and 28 (20.7%) were heavy manual workers. 3% of patients with sedentary lifestyle, 6.7% of patients who were moderate manual workers and 4.4% of heavy manual workers developed post operative instability. There is no statistical significance with the type of job and postoperative instability.

Conclusion: O f t he 135 patients there were 78 (57.8%) males and 57 (42.2%) female patients. Among the 19 (14.1%) poor outcome patients, 11 (8.1%) males and 8 (5.9%) females developed post operative instability. The age ranges from 18 to 68 years. The mean age was 43.3 years. 80 (59.3%), fall in the age group of 31-50 years. 20 patients (14.8%) were in the age group of less than 30 years. 35 patients (25.9%) fall into the age group of more than 50 years. Of the 135 patients, 19 patients (14.1%) developed post operative instability, who were in poor outcome group. Of the 135 patients, 31 (23%) had sedentary life style, 76 (56.3%) were moderate manual workers and 28 (20.7%) were heavy manual workers. 3% of patients with sedentary lifestyle, 6.7% of patients who were moderate manual workers and 4.4% of heavy manual workers developed post operative instability. There is no statistical significance with the type of job and postoperative instability.

REFERENCES

1. Stafford MA, Peng P, Hill DA. Sciatica: A review of history, epidemiology, pathogenesis, and the role of epidural steroid injection in management. Br J Anaesthesia 2007;99:461-73.
2. Walker BF The prevalence of low back pain : a systematic review of the literature from 1966 to 1998. J Spinal Disord 2000:13;20517.
3. Manchikanti L. Epidemiology of low back pain physician.2000 Apr;3(2):167-92.
4. Lidgren L.The bone and joint decade 2000-2010. Bulletin of the World Health Organization 2003;81(9):629.
5. Anderson G.Epidemiology of Spinal Disorder. In: Frymoyer JW. Ducker TB, Hadler NM,et al. eds. The adult spine: Principles and Practice. New York, NY: Raven Press. 1997:93-141.
6. Pope MH Biomechanics of the lumbar spine. Ann med 1989; 21: 374-351.
7. White A 111, Panjabi M: Clinical biomechanics of Spine, 2nd ed. Philadelphia, JB Lippincott, 1990, P 722.
8. Rauschning W: Anatomy of normal and traumatized spine. In sances A Jr, Thomas DJ, Ewing CL, et al (eds): Mechanisms of head and spine trauma. Goshen, NY, Aloray; 1986, PP 531-564.
9. Kazarian L, Graves G: Compression strength characteristics of human vertebral centrum. Spine 1977; 2: 1-14, 1977.
10. Galante J, Rostoker W, Ray R: Physical Properties of trabecular bone. Calcif tissue Res 1970;5:5236 – 5246.
11. Yoganandan N, Myklebust J, Wilson C, et al: Functional biomechanics of thoraco lumbar vertebral cortex . Clin Biomech 1988; 3: 11-18.
12. Giles LGF, Taylor JR , Intra –articular synovial protrusions in the lower lumbar apophyseal joints. Bull Hosp Jr Dis Orthop Inst. 82; 42:248-55.
13. Bogduk N, Engel R. The Menisci of the lumbar zygopophyseal joints. A review or their anatomy and clinical significance. Spine 1984; 9: 454-60.
14. Cyron BM, Hutton WC. The tensile strength of the capsular ligaments of the apophyseal joints. J Anat 1981;132:145-50.
15. Nikolai Bogduk : Anatomy of the spine . Spine care volume 2 Mosby edi I 1995; 810-835.
16. Bogduk N . Twomey LT: Clinical anatomy of the lumbar spine ed 2. Melbourne, 1991 Churchill living stone.
17. Roaf R: Study of mechanics of spinal injuries. J Bone Joint Surg Br 1960;42: 810-823.
18. Pintarn F, yoganandan N, Myers T, et al : Biomechanical properties of human lumbar spine ligaments. J Biomech 1992;25:1351-1356.
19. Tkaczuk H : Tensile properties of human lumbar longitudinal ligaments. Acta Orthop Scand 1968;115 (Suppl I) : 1-69.
20. Yong- Hing K, Reilly J, kirlaldy –willis W. The ligamentum flavum. Spine 1976;1(4):227-33.