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RESEARCH ARTICLE

EFFICACY OF NERVE ROOT BLOCK FOR THE TREATMENT OF LUMBAR SPINAL CANAL STENOSIS IN ADULTS OLDER THAN 80 YRS OF AGE

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Abstract

Background: Patients with advanced lumbar spinal canal stenosis (LCS) often prefer non-operative
treatment owing to decreased physiological function and comorbidities. Although the therapeutic value ofselective nerve root block (SNRB) for LCS is confirmed, there are few reports of its effectiveness in theelderly. We investigated the efficacy of SNRB for LCS in patients over 80 years of age.

Methods: The subjects were 112 patients aged over 80 years (mean age: 84 years; 45 men and 67 women)with medication-resistant LCS without cauda equina syndrome who underwent SNRB. Cases with acute-onset lumbar disc herniation were excluded. We retrospectively investigated and compared the presence orabsence of surgery, effect of SNRB, number of procedures, duration of disease, and magnetic resonanceimaging findings. Patients who could avoid the surgery by SNRB were defined as the effective group. Patientswhose symptoms were not relieved by SNRB and who underwent surgery and those whose symptoms werenot relieved but who continued conservative treatment were defined as the ineffective group. A total of oneto seven SNRBs were performed in both groups, and the same spine surgeon performed the entire procedurefrom SNRB to surgery.

Results: There were 86 nonoperative patients (69 effective cases) and 26 operative patients; the overall rateof effectiveness was 61% (69/112 patients). The area of the spinal canal at the responsible level was 108.63mm^{2}in the effective group compared with 77.06 mm 2 in the ineffective group. This was significantlynarrower in the ineffective group (p=0.0094). There was no significant difference in the duration of illness,number of blocks, or hernia complication rate between the groups. No patient experienced severe neuralgiathat may have been caused by neuropathy during SNRB.

Discussion: Our outcome showed that more than 60% of older patients with LCS showed symptomatic improvement with SNRB. SNRB can be performed relatively safely in the elderly and appears to be afavourable treatment option for older patients with various risks, such as poor general condition.

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Conclusions: Multiple sessions of SNRB may provide older patients with symptomaticimprovement and maybe an option for treatment.

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Introduction:-

Lumbar spinal canal stenosis (LCS), which is caused by degenerative or age-related changes such as yellowligament thickening and intervertebral foraminal stenosis, is reported to be more common in the elderly,with a particularly high incidence in people older than 80. Patients with LCS of the radiculopathy and mixedtypes often also have symptoms such as radicular pain, numbness, and intermittent claudication, which canaffect patient's quality of life and limit their activities [1]. Recently, the number of spinal surgeries has been increasing, and especially for older patients over 80 years of age the most common surgical condition is LCS.

Although immediate surgical intervention is necessary when accompanied by acute lower limb paralysis orbladder/rectal disorders, in the absence of such "red flags", the effectiveness of surgical treatment iscontroversial [2]. In addition, physiological function declines with age, and the incidence of comorbidities,such as cardiovascular disease and renal dysfunction, increases. The risk of perioperative complications inpatients with comorbidities is high, and the risk increases with age. Therefore, even patients with advancedLCS often are required to choose conservative therapy.

Non-operative treatment comprises rest, muscle relaxants, non-steroidal anti-inflammatory drugs, andphysical therapy. Selective nerve root block (SNRB) is an option when symptoms persist or when patients are not suitable for surgery. The therapeutic value of SNRB for lumbar spinal stenosis is accepted [1,3]. SNRBcan be performed at multiple sites, including the cervical and lumbar spine, and can reduce pain in patientswith severe pain.

In this study, we investigated the efficacy of SNRB in older patients (> 80 years of age) with LCS.

Materials and Methods:-

A total of 126 patients underwent SNRBwere included in this study. LCS was diagnosed on the basis of clinical symptoms and imaging findings.

Patients with acute-onset lumbar disc herniation, trauma, cauda equina syndrome, pain due to other factors,such as polymyalgia rheumatica, peripheral vascular circulatory disorders wereexcluded. The mean age ofthe patients was 84 years (range: 80-92 years); 57 were men and 69 were women.

We clarified the presence or absence of surgery, number of blocks performed, block effect, magneticresonance images, presence or absence of complications, and disease duration by clinical records. The magnetic resonance images were examined for the area of the spinal canal at theresponsible level and for the presence or absence of herniation. The area of the spinal canal was calculated asthe average of three measurements at the same level. For patients with visual analog scale (VAS) records,those whose scores decreased over time were defined as those with pain reduction. Of the nonoperative patients, thosewho achieved pain relief with SNRB were defined as the effective group, excluding those who did not wish toundergo surgery owing to advanced age, those who were ineligible for surgery owing to comorbidities andpoor general condition. We compared the results of each investigateditem between the effective group and the ineffective group. This study was approved and conducted at ACPM Medical College, Dhule, Maharashtra.

Technique:

SNRB was performed by the same spine surgeon. The patient was placed in the prone positionand received an injection of 1% bupivacaine. Although pain reproduction was not alwaysconfirmed, the drug was injected after confirming that the needle tip was in the optimal position.

The procedure was performed one to seven times in all patients. We performed SNRB at one- to four-weekintervals, depending on the patient's symptoms.

Statistical Analysis:
Data for both groups were confirmed to be normally distributed, and results were compared using t-tests foreach category. $P<0.05$ was consideredstatistically significant.

Results:-

Of the 126 patients who underwent SNRB, 96 patients werenonoperative, and 30 patients were operative. Comparing each category, the spinal canal area at the responsible level was 108.63 mm2in the effectivegroup and 77.06 mm^2in the ineffective group, and the ineffective group had a significantly narrower spinalcanal area than the effective group (p=0.0094). The duration of disease, number of blocks, andlumbar disc herniation rate were 8.43 months/18.95 months (p=0.112), 3.03 times/3.19 times (p=0.697), and38.2%/47.6% (p=0.449), in the effective/ineffective groups, respectively, with no significant difference. Although one of the patients in the effective group had a symptom relapse six months after the initialsymptom relief, the SNRB again relieved the symptoms. Thereafter, no symptom recurrence was observed.Of the ineffective group, three patients relapsed two to six months after symptom relief with SNRB andrequired surgical treatment. Since such patients were included in the ineffective group, the effective groupin this study did notinclude those who required surgical treatment owing to relapse of symptoms afterSNRB.

Discussion:-

In this study, we investigated the efficacy of SNRB in the treatment of LCS in patients older than 80 years ofage. As one of the options for conservative therapy, the efficacy of SNRB has been reported often [4]. Kannanet al. investigated the efficacy of SNRB in patients with radiculopathy who continued to have a VAS scoreeven after medication [1]. Seventy-six patients underwent SNRB and 35 patients subsequently requiredsurgery; 54% of the patients were able to avoid surgery, with SNRB. In this study, 61% of the patients wereable to avoid surgery, which provides effects similar to those of SNRB[8].

Regarding the prognostic factors for conservative treatment of LCS, lumbar kyphosis, range of motion,spinal canal area, and severe intermittent claudication have been reported previously [5-7]. In the presentstudy, we found that the spinal canal area at the responsible level was significantly narrower in theineffective group. As in the present study, the effect of conservative therapy is poor incases with a significantly narrowed spinal canal area, and conservative therapy may have therapeuticlimitations in these cases.

In the present study, the duration of disease was not significantly different between the effective andineffective groups; however, the p-value was low, at 0.112, and the duration of disease was 8.43 months and18.95 months, respectively [10]. Although there was no significant difference, the difference in disease durationwas large, suggesting that the longer the disease duration, the less successful the non-operative therapytends to be. As the number of cases increases, there will likely be a significant difference in the duration ofdisease.

In this study, the averagenumber of times that SNRB was performed was three, and the efficacy rate was 61%. Two weeks after asingle nerve root block was performed, the pain reduction rate was reported to decrease, and it is possiblethat multiple SNRBs may contribute to greater symptom relief. However, there have been no reports on theeffects of multiple nerve root blocks, and this study did not reveal data to support the optimal frequency.Considering our data, SNRB can be performedrelatively safely, even in the elderly [9].

There are several limitations to this study. First, the number of cases was small. As mentioned above,increasing the number of cases may reveal a significant difference between effective and ineffective groups,and further research is needed. Second, we were unable to score pain improvement measures such as theVAS in several of our cases. The older patients were the study population in this study, and it was difficult tomatch the VAS with verbal pain improvement and to reproduce the assessment by the VAS. It was possible to adequately follow the transition of symptoms through the statements of patients and family members in themedical record. Finally, the follow-up rate was low. It is true that not all patients who have improved havebeen followed up.

Conclusions:-

In this study, SNRB was effective in more than 60% of older patients with LCS. The therapeutic effect ofSNRB may be lower in cases of advanced LCS and in those with a long disease duration. SNRB may be arelatively safe treatment option for older patients with various perioperative risks.

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