An early diagnosis of spinal cord schwannoma:
the value of the pain syndrome

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Key words: spinal cord tumors, schwannoma, diagnosis, outcome.

Summary. In this study we present 76 cases of spinal cord schwannoma, treated in the Clinic of Neurosurgery Kaunas University of Medicine Hospital. The analysis of early clinical symptoms in diagnosis of schwannoma and the value of the pain syndrome as the first sign in manifestation of illness is emphasized. The results of operated patients in early stage are presented as well. The first symptom of schwannoma is pain; in 81.6 percent of cases it is radicular and in 11.8 percent – local. Early stage (radiculopathy) we determined to 19.7 percent of patients. Majority (95.8 percent) of operated patients in early stage improved and recovered. Neurologists and doctors of general practice must pay great attention to complaints of patients and course of illness when there are no results after 2 months of conservative treatment, they must sent the patient to neurosurgeon.

Introduction
Schwannoma originates from the sheath of spinal cord roots - neurilemma or Schwann cells (so it is mainly called neurilemmoma or Schwannoma) and makes one third of primary spinal cord tumors (1,6).
The tumor localization is in various parts of spinal cord, but prevails in cervical and thoracic, rare in lumbar and sacral regions (1-7). It can grow exophytic above and below the dura of spinal cord (extremely rare intramedullary) or involve the spinal root and interfere its fibers.
According to histological structure schwannoma is benign tumor, but growing in the narrow spinal canal makes a severe pathological situation: pain and later on the signs of spinal cord compression. It is pointed out that when the diagnosis of schwannoma is early and operation is performed before the spinal cord compression, good results are achieved (6,7).
In this article we discuss the early symptoms of spinal cord schwannoma - the features of pain syndrome.

Material and methods
In 1980-1994, 279 patients with spinal cord tumors were treated in the Clinic of Neurosurgery at Kaunas University of Medicine Hospital and among them 76 patients (27.2 per cent) had schwannoma: 25 (37.9 per cent) males and 51 (67.1 per cent) females. The mean age of males was 47.9 years (13-86 years) and females - 49 years (16 - 81 years).
Diagnosis was grounded on the data of clinical and instrumental investigations. Neurological examination and plain films were done. Later on cerebrospinal fluid (CSF) pressure, protein, cells, biochemistry and dynamics were investigated.
In order to indicate the location of tumor, radiological contrast method was used, e.g. positive myelography (ascendant and descendent) was done with radioactive RISA J$^{131}$ or macroalbumins - J$^{131}$, Tc$^{99m}$, In$^{111}$ and scanning was performed. To some patients diagnosis was stated on postmyelographic computer tomography.
Radiculopathy was attributed to motor deficits.
The early postoperative results were evaluated before departure of patient from hospital and during follow-up 0.5-1 year till 10-15 years after operation. Those results were evaluated in the policlinic or according to the inquiry form. After removal the tumor was histologically examined.
The data statistic analysis was done using Epi Info and other statistical programs.

Results and discussion
Among the operated 76 patients who had spinal cord schwannoma, the tumor localization was in thoracic (60.5 per cent), in cervical (25.0 per cent) and in
lumbar (14.5) regions. The main localization of schwannoma was dorsal and dorsolateral (59.1 per cent), rarely - ventral and ventrolateral (15.8 per cent), dumbbell tumors (craniospinal or foramen magnum) (9.2 per cent) and the others – 15.9 per cent.

Histological examination of removed tumors showed schwannoma in 72 cases; in 7 cases neurofibroma was found, 2 cases with the signs of neurofibromatosis being among them.

According to the onset of illness from the first symptoms till hospitalization, 29 patients saw the doctor during the first year, but 47, the largest part, saw doctor after 2-10 years following the first symptoms. The complaints of patients and preoperative neurological symptoms are showed in Table.

Evaluating the preoperative motor deficits we found the early (radiculopathy) stage in 15 (19.7 per cent) cases, monoparesis in 2 (6.6 per cent), paraparesis in 41 (53.9 per cent), paraplegia in 5 (6.6 per cent), tetraparesis and tetraplegia both in 6 (7.9 per cent) and hemiparesis in 1 (1.3 per cent) case. The data of our investigation showed that only to one fifth (19.7 per cent) of our patients an early stage of illness was determined. Other authors diagnosed this early stage to one third of patients and more severe motor deficits – to two thirds of patients (2,6).

To all patients with schwannoma the first clinical symptom was pain, which manifest earlier than other clinical symptoms and was of various intensity. It was a long time (months and years) from the onset of pain till manifestation of other symptoms. The root pain prevailed (81.6 per cent) and was attributed to one root. The patients complained of the local pain in 11.8 per cent of cases and in paresthesias – 6.6 per cent. The intensity of pain belongs to the position of patient, increased at night lying, at coughing, laughing sneezing, straightening, because increased intrathoracic and intraabdominal pressure, and relieved sitting. The pain localization was in one (tumor) place, sometimes spread in both sides, mostly temporary, but constantly in the same place and hurt as a knife. At the beginning the root pain is attributed to the disturbance of nerve conductivity because of the direct or indirect irritation of nerve root or to root compression by the tumor. Later on when compression increases to spinal cord, spinal tracts damage and vegetative pain develops (3,7).

We along with other authors (3,5,6) have stated that the character of pain syndrome depends on schwannoma localization. If the upper cervical schwannoma of spinal cord grows, the patient complaints of the pain in the neck, occiput shoulders and arms when schwannoma is in the region of cervical fourth vertebra. To more than half of patients the pain is very intensive. When schwannoma is of thoracic localization, ¾ of patients develop thoracic pain. When schwannoma is located in the middle thoracic region, the pain spreads to abdomen, back, tights and legs. The pain is unilateral mainly on the tumor side. The pain that spreads to upper or lower limbs may be evaluated as discogenic (6) and patients are operated as with herniated discs. Among our patients 2 were previously operated as herniated discs. To those patients there was no effect after operation and neurological symptoms progressed; after one month schwannoma of spinal cord was diagnosed and removed and neurological symptoms disappeared. The local pain by percussion or compression is more common to schwannoma of cervical location and increases when spinal cord and roots are caudally damaged.

The outcome of schwannoma removal closely correlates to preoperative neurological condition of patient (6,7). Among the treated in early (radiculopathy) stage, 95.8 per cent of patients recovered.

Conclusions
The first symptom of schwannoma is pain; 81.6 per cent is root pain and 11 per cent - local. An early (radiculopathy) stage was determined to 19.7 per cent of patients. Large number (95.8 per cent) of operated patients in early stage has recovered. Neurologists and doctors of general practice must pay great attention to complaints of patients and course of illness. When there are no results after 2 months of conservative treatment they must refer patients to neurosurgeons.
Ankstyva nugaros smegenų švanomos diagnostika: skausmo sindromo reikšmė

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Raktažodžiai: nugaros smegenų navikai, švanoma, diagnozė, baigtis.


Išvados. Švanomos pirmasis simptomas yra skausmas, 81,6 proc. – šaknelinis, 11,8 proc. – lokalus. Nustatyta diagnozė ankstyvusys (radikulopatijos) stadijos 19,7 proc. ligonių, o 95,8 proc. operuotų ligonių, kuriems buvo diagnozuota ankstyvosios švanomos, pasveikio arba jų būklė pagerėjo. Neurologai ir bendrosios praktikos praktikos gydytojai turi atkreipti ypatingą dėmesį į ligonio nusiskundimus ir ligos eiga. Kai nesulaikyti jokio po vėlų mėnesių konservatyvus gydymo, jie privalo siūsti ligonį neurochirurgo konsultacijos.

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References

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