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Spinal tumors operated at University Clinical Centre of Kosova in the periods 2015-2020

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Abstract

Introduction: Spinal tumors are abnormal masses that grow uncontrollably from normal cell growth and are mainly located around the **spinal cord** and **column**. Primary tumors originate in the spine or spinal cord while secondary or **metastatic** tumors appear in other parts of the body and spread from there to the spine. Spinal tumors are referred to depending on the region where they appear (Cervical, thoracic lumbar and sacrum), as well as their location on the spine.

Purpose: The purpose of this research was the analysis of spinal tumors operated and treated at the University Clinical Center of Kosovo in the Neurosurgery Clinic.

Materials and methods: In this retrospective clinical study, are taken into account spinal tumors operated in the Emergency Center of UCCK during the period 2015-2020 . Depending on the region and location of the tumors, the patients who underwent the operations were selected in Observation groups.

Results: In the neurosurgery clinic at UCCK since 2015-2020 have been operated and treated a number of 66 cases of spinal tumors . In the results obtained it was noticed that most of the patients were females with a total of 40 cases or 60.61%. The researched cases were also looked at in terms of neurological function, 29 patients had neurological deficits expressed as Quadriparesis, Quadriplegia, Paraparesis and Paraplegia. The time that patients spent in the Neurosurgery Clinic at UCCK, varies depending on the region where the operation was performed and the condition of the patients after the operation.

Conclusion: From the results achieved in this research we have concluded that women have been more prone to the formation of back tumors in almost 2/3 of cases (60.61%) compared to men. Depending on the location of the tumors it has been seen that the most common are tumors of the Lumbo-Sacral region expressed as Meningiomas, Astrocytoma, Ependymoma, Neurinoma and Metastatic Tumors.

Key words: Spinal tumors, Cervical Region, Thoracic Region, Lumbo-Sacral Region, Neurosurgery clinic in UCCK.

1.Introduction

Spinal tumors are abnormal masses that grow uncontrollably from normal cell growth and are mainly located around the **spinal cord** and **column**. They can be cancerous (**malignant**) and non-cancerous (**benign**). Primary tumors originate in the spine or spinal cord while secondary or **metastatic** tumors appear in other parts of the body and spread from there to the spine. Spinal tumors are referred to depending on the region where they appear (Cervical, thoracic lumbar and sacrum), as well as their location on the spine.[1]

Intramedullary tumors such as astrocytomas, ependymomas, and gliomas begin inside the cells within the spinal cord itself.

Extramedullary tumors (schwannomas, neurofibromas, meningiomas and nerve sheath tumors) can develop in the spinal cord membrane or along the nerve roots that emerge from the spinal cord, where they compress the spinal cord, causing problems with its function. [2]

Extradural tumors are the most common tumors that form outside the spinal cord and dura. Such tumors can be created by the vertebrae themselves (osteoid osteomas, osteoblastomas, osteosarcomas are considered primary tumors), but often come from tumors that metastasize from cancers of other organs. [3]

Primary Spinal Tumors are of particular importance, as their timely diagnosis and intervention provides a better prognosis and the possibility of cure. [4]

Spinal tumors, which most often involve the spinal cord, are often tumors metastasized from internal organs, for the diagnosis and treatment of which multidisciplinary knowledge is needed. These tumors make up a low percentage of the complaints and other symptoms that Originate from the spine.[5]

Spinal tumors based on the location in the spinal cord and on the nerves they affect, give symptoms such as back pain or pain in the legs, arms, clumsiness and problems with the bowels or bladder. [6]

After evaluating the patient's condition, conservative treatment such as physical therapy and non-steroidal anti-inflammatory drugs may be started, and if this does not help to improve their condition, then imaging tests may be required such as CT (computed tomography) or MRI (magnetic resonance imaging), to verify the cause and origin of the pain. [6,7]

2. Purpose

The purpose of this research was the analysis of spinal tumors operated and treated at the University Clinical Center of Kosovo in the Neurosurgery Clinic.

The specific objectives were to analyze the treatment of patients with spinal tumors, their prevalence, location of the tumors in the spinal region and neurological deficits

3. Materials and methods

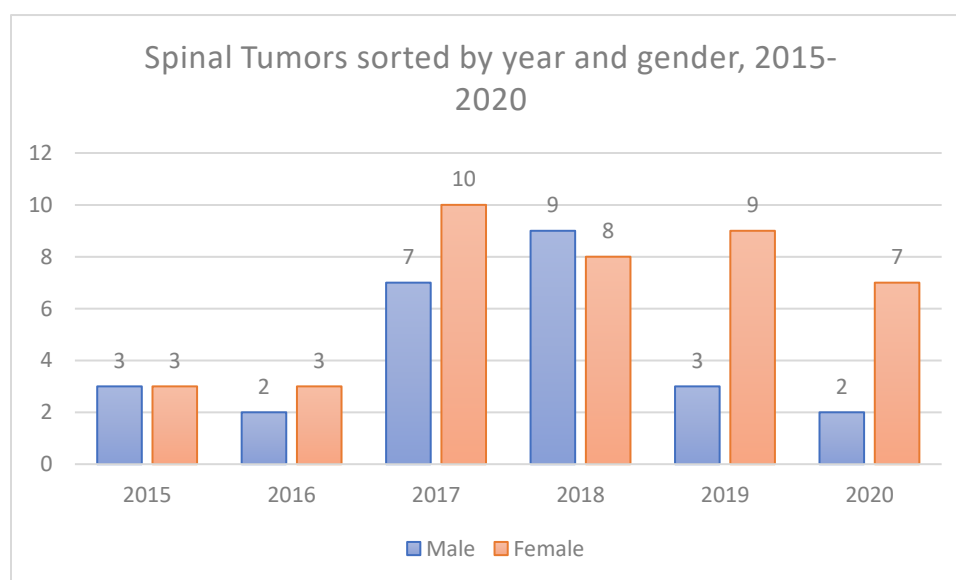
In this retrospective clinical study, are taken into account spinal tumors operated in the Emergency Center of UCCK during the period 2015-2020 . Depending on the region and location of the tumors, the patients who underwent the operations were selected in Observation groups. The results obtained are presented in tables and graphs.

4.Results

In the neurosurgery clinic at UCCCK since 2015-2020 have been operated and treated a number of 66 cases of spinal tumors . In the results obtained it was noticed that most of the patients were females with a total of 40 cases or 60.61%. The smallest number of registered cases was during 2016 with only 5 cases where 2 were males and 3 females, while the highest number was in 2017 and 2018 with 17 cases.

Table 1: Performance of cases with Spinal Tumors operated by UCCCK, sorted by year and gender,2015-2020

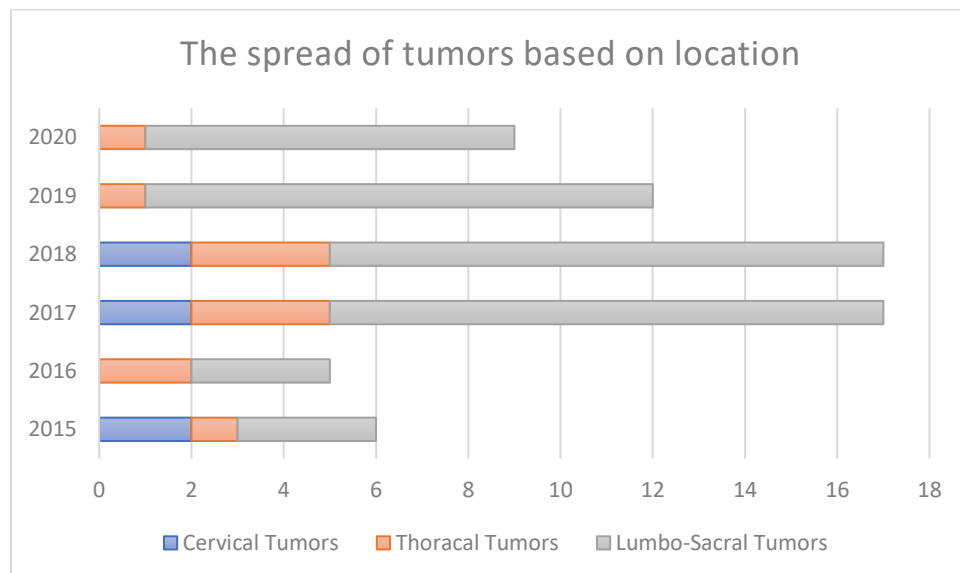
Year	Cases	M		F	
		N	%	N	%
2015	6	3	50.00	3	50.00
2016	5	2	40.00	3	60.00
2017	17	7	41.18	10	58.82
2018	17	9	52.94	8	47.06
2019	12	3	25.00	9	75.00
2020	9	2	22.22	7	77.78
Total	66	26	39.39	40	60.61



Depending on the location where tumors are developed in the spine, we notice that most patients suffer from tumors of the Lumbo-Sacral region, with a number of 49 cases and least from the tumors of the cervical region with only 6 cases.

Table 2: *The spread of tumors based on location, sorted through the year and regions of the spine.*

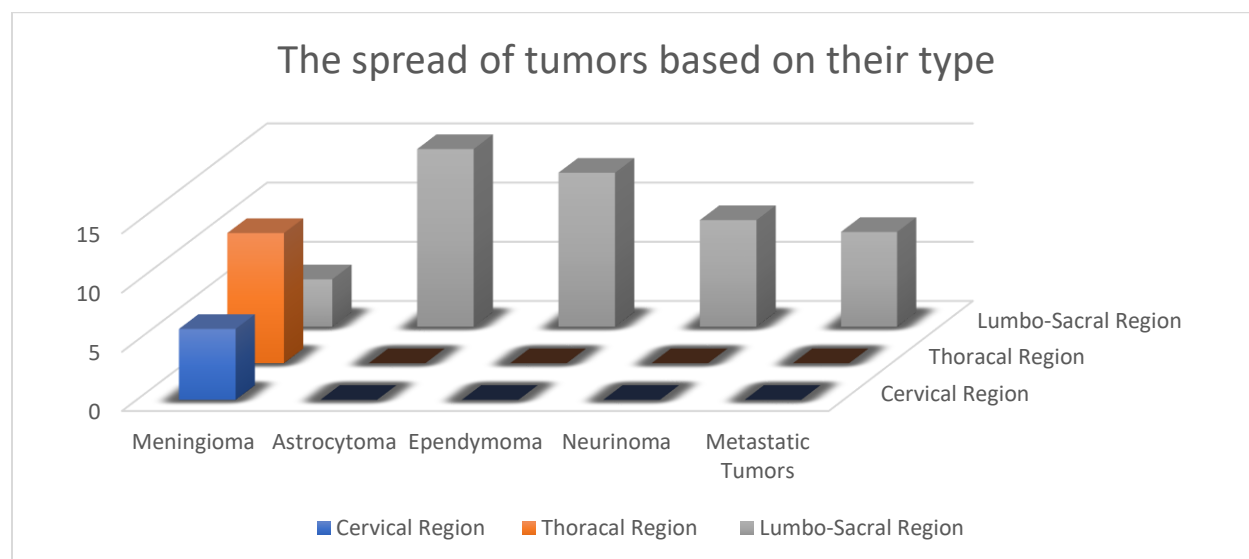
	Cervical Region	Thoracic Region	Lumbo-Sacral Region	Total
2015	2	1	3	6
2016	0	2	3	5
2017	2	3	12	17
2018	2	3	12	17
2019	0	1	11	12
2020	0	1	8	9
Total	6	11	49	66



Based on the type of tumors, it has been observed that in the cervical and thoracic region only meningioma tumors are encountered with 6 and 11 cases, while in the lumbo-sacral region the tumor types are more variable, encountering Meningioma, Astrocytoma, Ependymoma, Neurinoma and Metastatic Tumors, of which the most pronounced are Astrocytoma with 15 and Ependymoma with 13 cases.

Table 3: *The spread of different types of spinal tumors in different regions of the spine*

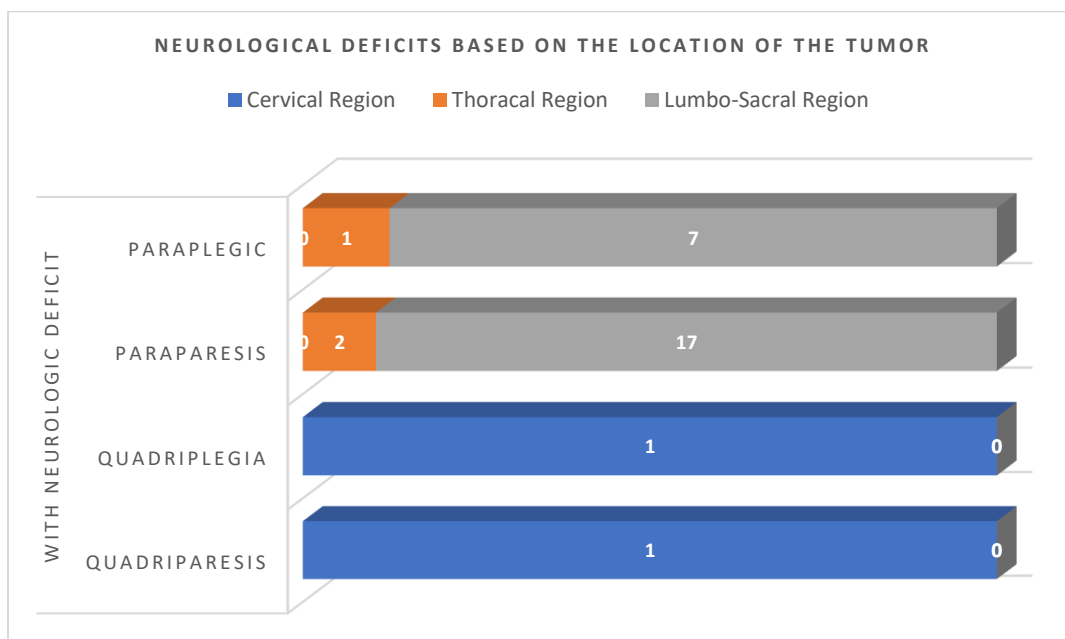
Types of Tumors	Cervical Region	Thoracal Region	Lumbo-Sacral Region	Total
Meningioma	6	11	4	22
Astrocytoma	0	0	15	15
Ependymoma	0	0	13	13
Neurinoma	0	0	9	9
Metastatic Tumors	0	0	8	8
Total	6	11	49	66



The researched cases were also looked at in terms of neurological function, in which case it was understood that out of 66 cases observed, 29 of them had neurological deficits expressed as Quadriparesis, Quadriplegia, Paraparesis and Paraplegia. Looking at the results we understand that patients with tumors in the cervical region are more prone to quadriplegia, while on the other hand more frequent deficits in the form of Paraparesis with 19 cases and paraplegia with 7 cases were expressed in patients with tumors in the Lumbo-Sacral region.

Table 4: Spinal tumors associated with neurological deficits, sorted by region where they are located

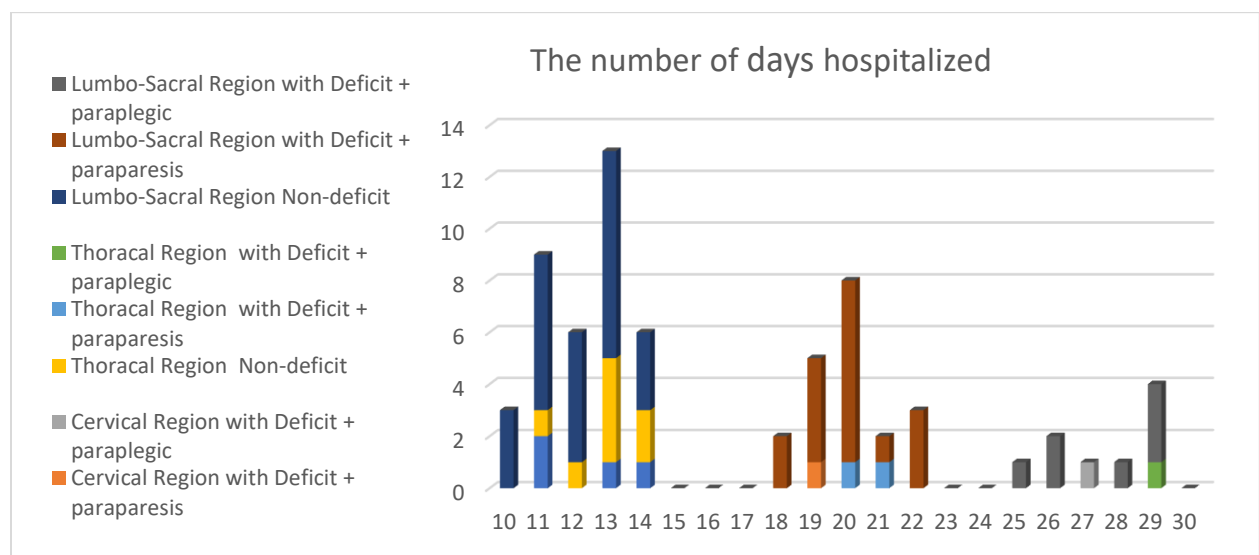
	With Neurologic Deficit				Without Neurologic Deficit	Total
	Quadriparesis	Quadriplegia	Paraparesis	Paraplegic		
Cervical Region	1	1	0	0	0	6
Thoracal Region	0	0	2	1	8	11
Lumbo-Sacral Region	0	0	17	7	25	49
Total	1	1	19	8	37	66



The time that patients spent in the Neurosurgery Clinic at UCK, varies depending on the region where the operation was performed and the condition of the patients after the operation. Patients who did not have neurological problems spent an average of 10-14 days in the clinic, patients who showed neurological deficits in the form of paraparesis had a stay of 18-22 days while those with deficits in the form of Paraplegia 25-30 days.

Table 5: Number of days hospitalized, sorted by tumor region and postoperative condition with or without neurological deficits

		Hospitalized Days																													Total			
		10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30												
Cervical Region	Non-deficit	0	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
	with Deficit + paraparesis	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	with Deficit + paraplegic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Thoracal Region	Non-deficit	0	1	1	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
	with Deficit + paraparesis	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	with Deficit + paraplegic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	
Lumbo-Sacral Region	Non-deficit	3	6	5	8	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	
	with Deficit + paraparesis	0	0	0	0	0	0	0	0	2	4	7	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	
	with Deficit + paraplegic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	1	3	0	0	0	0	0	0	0	0	0	0	0	7	
Total		3	9	6	13	6	0	0	0	2	5	8	2	3	0	0	1	2	1	1	4	0	0	0	0	0	0	0	0	0	0	66		



5. Discussion

In the results of spinal tumors operated in the Neurosurgery Clinic at UCCCK, it was noticed that more than half of the operated cases (60.61%) were female. In a study conducted in 2021 by the American Cancer Society, which analyzed the incidence of central nervous system tumors, they concluded that the chances of developing CNS tumors are slightly higher in women, but the chances that tumors developed are malignant, are larger in males. The increase in the incidence of CNS tumors in women was also seen in the results published by a registry research in Gironde (France), where during the research it is shown a trend of increasing CNS tumors, which had a more pronounced increase in females. [8,9]

When we looked at spinal tumors in the results we found that most of them are located in the Lumbo-Sacral region, followed by the thoracic region and less in the cervical region, slightly different results were seen in the study of spinal metastases at the University of Missouri at Columbia, where it is said that tumors are most often found in the thoracic region, followed by the Lumbar Region. [10]

Out of 66 cases, only 6 tumors were in the Cervical region and all of them were meningiomas, while with tumors in the Lumbo-Sakral region there were 49 cases where astrocytomas and ependymomas dominated. In a publication by the American Society of Neurological Surgeons the results show that astrocytomas and ependymomas are the most common tumors and are most commonly found in the thoracic region followed by the cervical region. [1]

Neurological tumors have caused neurological damage that has led to various deficits and symptoms such as Quadripareisis, Quadriplegia, Paraparesis and Paraplegia. In a case reported by Baylors University Medical Center in Texas of an 18 year old person who while riding a motorcycle had an accident, after performing diagnostic methods it was seen that the patient experienced a neurological deficit caused by intramedullary cervicothoracic ependymoma. The position of the spinal cord is of a restrictive nature that in case of compression, contributes to causing neurological deficits.[11,12]

The days of hospitalization of patients have been dependent on the type of tumor, thus ranging from 10-30 days. Patients with neurological deficits had a worse prognosis, so they stayed longer in hospital care. In a publication published in the Neurosurgeons of New Jersey, hospital stays in normal cases averaged 3-5 days, with the rest of the treatment done at home. Depending on the type of tumor, the recovery time is from 3-4 weeks for intradural tumors to 3-6 months for metastatic tumors.[13]

6. Conclusion

From the results achieved in this research we have concluded that females have been more prone to the formation of spinal tumors in almost $\frac{2}{3}$ of cases (60.61%) compared to men. Depending on the location of the tumors it has been seen that the most common are tumors of the Lumbo-Sacral region with 4 times more than tumors of the thoracic region and 8 times more than tumors of the cervical region.

In the cervical and thoracic region only Meningeomas are expressed, while in the Lumbo-Sacral region there are different types of tumors where besides meningiomas there are also Astrocytoma, Ependymoma, Neurinoma and Metastatic Tumors.

The presence of different types of tumors in different locations in the spine is expressed with neurological deficits in the form of Quadriparesis, Quadriplegia, Paraparesis and Paraplegia in 29 patients or 44% of all cases. A noticeable feature of the tumors of the cervical region is the deficit expressed more in the form of Quadriparesis, Quadriplegia, while the tumors of the Lumbo-Sacral region are expressed more with deficits in the form of Paraparesis and Paraplegia.

Patients with spinal tumors have been ordered to stay in hospital for a period of 10 to 30 days depending on the region the operation was performed and their condition. Deficits mostly came from tumors of the lumbosacral region, and in terms of the type of neurological deficit are most often expressed in the form of paraparesis.

7. Refereces

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