

RESULTS OF SURGICAL TREATMENT OF PATIENTS WITH BENIGN SPINAL TUMORS

Akhmed Berun

SSSMU

Purpose of the study. Justification of treatment tactics for patients with primary spinal tumors. Material and methods. The experience of surgical treatment of 47 patients with benign spinal tumors was analyzed. The treatment strategy was formed taking into account the type of tumor, its localization and somatic status of the patient. To study the lesion, X-ray examination, CT and MRI were used, and some patients underwent puncture trepanobiopsy.

Results. Tumor recurrence was registered in 6 (14.6 %) patients. This suggests that, despite the possibilities of modern diagnostic tools, during the operation, it was not possible to determine a clear border of the tumor in all cases. Functional results of treatment included restoration of spinal column supportability and regression of pain symptoms in all cases. Bone grafting was the method of choice for interbody defect replacement. Conclusion. Performing radical surgeries (corporectomies and spondylectomies) significantly reduces the risk of relapses. Localization of the tumor in поясничнокрестцовомthe lumbosacral region in the presence of a paravertebral component creates serious technical difficulties for its radical removal. Cortical-spongy autograft has proven to be a good plastic material for replacing defects after vertebral resection and forming a fusion. Key words: benign tumors, spine, spondylectomy.

Introduction

Benign spinal tumors account for 8% of all bone benign and 40 % of diagnosed tumors. They are often малигнизируютсяmalignified and account for up to 80 % of primary malignant tumors of the spine and sacrum [5, 7].

Problems in the treatment of patients with primary spinal tumors begin already at the stage of diagnosis of the disease. A long latent period of development of the pathological process, a poor clinical picture with the absence of pathognomonic symptoms lead to the fact that diagnostic errors reach 80 %, and, as a result, the surgeon often has to deal with already existing complications in the form of a pathological vertebral fracture, spinal column instability and spinal cord compression.

Objective: to substantiate the tactics of treatment of patients with primary spinal tumors.

Material and methods

We observed 47 patients with benign prostatic hyperplasia.

This figure accounted for 30% of the total number of patients operated on for spinal neoplasms. These are mainly patients with giant cell tumors (GCS), osteochondroma, hemangioma, and osteoblastoma. Most often (77% of cases), the disease occurred in the second and third decades of life, and much less often-in later life (Table). Certain regularities were also observed in the localization of benign tumors on the vertebral column and vertebra proper. Most neoplasms are diagnosed in the thoracic and lumbar

spine, with the exception of osteochondroma and aneurysmal bone cyst (ACC), which affect any level. The vertebral body is a favorite location for hemangiomas and GKO. Osteochondroma, osteoblastoma, ACC, and osteoid-osteoma were detected in the vertebral arch.

The basic task for choosing the treatment regimen for patients was to verify the neoplastic process. To study the lesion site (its structure, localization, relation to surrounding tissues, etc.), a standard X-ray examination, CT and MRI were used. Taking into account the fact that most of the clinical and radiological signs in patients were non-specific, special attention was paid to the biopsy of the lesion.

For this purpose, a puncture trepan biopsy was performed. It is worth noting that the patient's examination in a specialized hospital in the optimal mode took at least two weeks (taking into account the time required for processing histological material). Therefore, another important factor influencing the diagnostic algorithm and the choice of treatment method was the clinical picture of the disease. If the leading manifestation was vertebral syndrome, and neurological disorders were absent or insignificant, a comprehensive examination of the patient was carried out for the purpose of histological verification of the tumor. In the presence of severe neurological disorders and the need for decompressive surgery, the examination was limited to determining the volume of the tumor and preventing complications.

Results and discussion

Modern diagnostic methods allowed us to verify the tumor at the preoperative stage in 41 (87.2 %) patients.

At the second stage of the disease, according to the classification, 31 (66 %) patients were operated on, including 5 with GKO, 9 with osteochondroma, 3 with osteoblastoma, 2 with ACC, as well as all patients with hemangioma, osteoidosteoma and osteoma. In this group of patients, clinically, the process was characterized by moderate pain, 1-2 points on the McAfee pain scale, [6], and radicular disorders, and radiologically, progressive tumor growth was noted, separated from the surrounding tissue by a thinned pseudocapsule. In 16 (34 %) patients, the disease was diagnosed at a later, third stage with pronounced clinical manifestations. Most of the tumors were represented by such pathologies as GKO, osteoblastoma, and ACC. All patients had intense pain (3-4 points), and 9 patients had neurological disorders up to deep paresis (4 cases) and plegia (2 cases). Moreover, in 14 (87.5 %) patients of this group, a sharp deterioration in the dynamics of the disease was associated with a pathological vertebral fracture. There was an aggressive type of tumor growth, they practically did not have a capsule and penetrated into soft tissues.

In the group of patients with a verified diagnosis, treatment tactics depended on the type of tumor, localization and prevalence of the process, as well as the patient's somatic status. Due to the low efficiency of radiation and drug therapy, the surgical method was the main one in the treatment of this category of patients.

It is generally accepted that only complete removal of the tumor (in most cases with the widest possible resection margin) reduces the risk of recurrence of the disease. Radical

surgical methods were used to remove aggressive tumors with pronounced clinical manifestations. Thus, 16 patients (10 - with GKO, 5 - with osteo-blastoma, 1 - with xanthogranuloma) underwent total tumor removal using a block with bone grafting of the defect and stabilization of the affected vertebral segment. Corporectomy (4 cases) and wide resection with removal of up to three quarters of the vertebral body (3 cases) were performed in seven of them when the neoplasm was localized exclusively in the vertebral body. The spread of the process to the legs of the arch in six people and total damage to the vertebra in three was an indication for performing spondylectomy.

It should be noted that the volume of radical surgery and vascularization features of some tumors, such as GKO, caused significant intraoperative bloodloss. Thus, during spondylectomy, the average blood loss was 1900.0 ± 625.4 ml, and in one case it reached 3100.0 ml, which largely determined the need to divide the surgical intervention into two stages. However, the age of the patients and the absence of severe concomitant pathology made it possible to perform this operation in one stage in seven of them.

In four cases, the localization of the tumor and a pronounced soft tissue component did not allow its radical removal. In two patients, the tumor was removed in parts by resection of the vertebra, and in two more patients (with sacral damage), its curettage was performed.

The same method of tumor removal was used in all patients with ACC, osteoma, and osteoid-osteoma. Considering the requirements of ablative surgery in patients with osteochondroma, its localization caused resection of the spinous process in six cases and the arch in four.

Five patients with hemangioma, recurrent pain after radiation therapy and the risk of pathological fracture underwent вертебропластику bone cement puncture vertebroplasty.

In the group of patients without verification of the process at the preoperative stage, the scope of the operation was planned taking into account the clinical and radiological picture of the spinal lesion and the patient's somatic condition. Considering the probability of detecting an aggressive (including malignant) tumor, the treatment strategy was based on planning radical treatment (spondylectomy). Thus, when the lesion focus was located in the vertebral body, all patients underwent reposition and stabilization of the damaged segment with a transpedicular device and an open biopsy. The second stage (according to indications) was performed corporectomy. In the presence of spinal cord compression or involvement of the posterior vertebral elements in the pathological process, an extended laminectomy (with removal of the arch legs) was additionally performed at the first stage with a block.

The results of treatment were evaluated according to the following parameters: absence of tumor recurrence and malignancy, spinal column support capacity, regression of pain and neurological symptoms.

Thus, tumor recurrence was registered in 6 (14.6 %) patients. At the same time, in the group of patients who received radical treatment in the scope of corporectomy or spondylectomy, this complication was not observed during follow-up from one and a half

to five years. Relapse occurred in a patient with osteoblastoma, in whom, like in two other patients, the tumor was removed by a block with resection of 3/4 of the vertebral body, as well as in four patients with GKO and osteo-blastoma, and in a patient with ACC after their removal in parts or curettage. Because of relapses, repeated surgical treatment was performed in four of these patients. In two cases, there were no complications after radical surgery. In two patients, removal of the vertebral body and the soft tissue component of the tumor did not lead to the expected result. In one patient with osteoblastoma, malignancy of the process was noted two years after surgery, and its prevalence did not allow for repeated intervention.

These results show that, despite the possibilities of modern diagnostic tools, it was not possible to determine a clear border of the tumor during the operation in all cases. This is typical for spinal lesions with GKO, osteoblastoma, and ACC with a predominantly lytic type of the process, complicated by a pathological fracture, or with a widespread soft tissue component. Therefore, block surgery with partial vertebral resection and partial curettage or curettage are insufficient in the treatment of aggressive tumors such as GKO and osteoblastoma. It should also be noted that most of the complications occurred when the tumor was located in the lumbosacral region. This is due to the fact that due to the anatomical features of the spine, with paravertebral spread of the tumor, its wide excision in this part, zone IB-III B, according to the classification of Weinstein J.N.[3], is associated with the risk of technical complications.

Functional results of treatment included restoration of spinal column support capacity and regression of pain symptoms in all cases. In our case, bone grafting was the method of choice for interbody defect replacement. So, in the case of radical interventions, a full-fledged supporting cortical-lipped autograft from the iliac crest was used. During economical resections of the vertebra, they were limited to autorebral plastic surgery (during operations on the thoracic region) or bone chips. Based on spondylograms, we analyzed the dynamics of bone block formation and compared it with those in patients with spinal injuries operated on in a similar way [1]. In the group of patients with spinal tumors, the periods of ventral bone block formation occurred in terms corresponding to those in the control group in 37 (78.7 %) patients. In three patients with GKO who received radiation therapy before surgery and one after it, the rate of bone block formation lagged behind the control group by 1-2.5 months, and in one case, graft resorption occurred. In all patients with recurrent neoplasms, bone block did not occur due to graft involvement in the tumor process. However, in the conditions of spine stabilization by metal construction, these complications did not lead to a violation of the spinal support capacity during the entire follow-up period. In general, the result of restoring spinal support was characterized by a significant regression of pain symptoms (Fig. 1).

Regression of neurological symptoms depended on the level and type of dural sac compression, the severity of symptoms, and its duration (Fig. 2). In one patient, tumor recurrence was accompanied by a repeated increase in neurological deficit.

Complications in surgical treatment of patients with benign spinal tumors are mainly associated with deviations from the surgical treatment method and errors in choosing the

timing of intervention after radiation therapy in patients with GKO. Suppuration of the surgical wound was observed after posterior approaches in 2 (4.2 %) patients. However, the surface nature of the process did not lead to the removal of the metal structure. In two patients who received a course of radiation therapy in the preoperative period, soft tissue dystrophic changes caused a delay in the healing time of the postoperative wound by one and a half and two times, respectively. In one case, a year and a half after the operation, a fatigue fracture of the locking rod of the transpedicular device was detected, which did not affect the outcome of treatment. In one patient, punctured vertebroplasty was complicated by the leakage of bone cement into the spinal canal with compression of the dural sac, which required surgical treatment to remove the cement.

Conclusion

Evaluating the results of surgical treatment of patients with benign spinal tumors, it is worth noting that the long latent period of the disease, the absence of specific signs of most neoplasms significantly complicate their timely detection, and a puncture biopsy remains a necessary measure for their histological verification. Difficulties in determining the boundaries of the tumor and unaffected tissues expand the indications for performing radical operations (corporectomy and spondylectomy) in the treatment of tumors such as GKO and osteoblastoma. Localization of the tumor in the lumbosacral region in the presence of a paravertebral component has always created serious technical difficulties for its radical removal. Cortical-sponge autograft is a good plastic material for replacement of defects after vertebral resection and fusion formation.

Literature

1. A., Khamidov O., and Shodmanov F. J. 2023. "Computed Tomography and Magnetic Resonance Imaging Play an Important Role in Determining the Local Degree of Spread of Malignant Tumors in the Organ of Hearing". Central Asian Journal of Medical and Natural Science 4 (3), 929-39. <https://cajmns.centralasianstudies.org/index.php/CAJMNS/article/view/1600>.
2. Abdurakhmanovich, K. O., & ugli, G. S. O. (2022). Ultrasonic Diagnosis Methods for Choledocholithiasis. Central Asian Journal Of Medical And Natural Sciences, 3(2), 43-47.
3. Abdurakhmanovich, K. O., & ugli, G. S. O. (2022). Ultrasound Diagnosis of the Norm and Diseases of the Cervix. Central Asian Journal Of Medical And Natural Sciences, 3(2), 58-63.
4. Akbarov S. et al. VALUE OF US AND DOPPLEROMETRY IN CHRONIC PYELONEPHRITIS OF PREGNANT WOMEN //Yangi O'zbekiston talabalari axborotnomasi. – 2023. – T. 1. – №. 2. – C. 26-29.
5. Akhmedov YA, Ataeva SKh, Ametova AS, Bazarova SA, Isakov HKh THE HISTORY OF THE DEVELOPMENT OF RADIATION DIAGNOSTICS. Web of scientist: International scientific research journal. 2021;2:34-42.
6. Akhmedov YA, Rustamov UKh, Shodieva NE, Alieva UZ, Bobomurodov BM Modern Application of Computer Tomography in Urology. Central Asian journal of medical end natural sciences. 2021;2(4):121-125.
7. Alimdjanovich, R.J., Obid , K., Javlanovich, Y.D. and ugli, G.S.O. 2022. Advantages of Ultrasound Diagnosis of Pulmonary Pathology in COVID-19 Compared to Computed Tomography. Central Asian Journal of Medical and Natural Science. 3, 5 (Oct. 2022), 531-546.
8. Alimdjanovich, Rizayev Jasur, et al. "Start of Telemedicine in Uzbekistan. Technological Availability." Advances in Information Communication Technology and Computing: Proceedings of AICTC 2022. Singapore: Springer Nature Singapore, 2023. 35-41.

9. Amandullaevich A. Y., Abdurakhmanovich K. O. Organization of Modern Examination Methods of Mammary Gland Diseases //Central Asian Journal of Medical and Natural Science. – 2022. – T. 3. – №. 5. – C. 560-569.
10. Ataeva SKh, Ravshanov ZKh, Ametova AS, Yakubov DZh Radiation visualization of chronic joint diseases. Central Asian journal of medical end natural sciences. 2021;2(2):12-17
11. Babajanovich K. Z., Abdurakhmanovich K. O., Javlanovich Y. D. Ultrasound and MSCT as the Next Step in the Evolution of the Examination of Patients with Ventral Hernias //Central Asian Journal of Medical and Natural Science. – 2022. – T. 3. – №. 5. – C. 583-591.
12. Baxitjanovich, Bekjanov Nursulton. "QARAQALPAQSTAN RESPUBLIKASI AWIL XOJALIG'I TOPIRAQLARIN EKOLOGIYALIQ BAHALAW." Galaxy International Interdisciplinary Research Journal 10.10 (2022): 397-399.
13. Gaybullaev S. O., Fayzullayev S. A., Khamrakulov J. D. Cholangiocellular Cancer Topical Issues of Modern Ultrasound Diagnosis //Central Asian Journal of Medical and Natural Science. – 2023. – T. 4. – №. 3. – C. 921-928.
14. Hamidov OA, Diagnostics of injuries of the soft tissue structures of the knee joint and their complications. European research. Moscow. 2020;1(37):33-36.
15. I., Davranov I., and Uteniyazova G. J. 2023. "Koronavirus Diagnostikasida O'pkani Ktsi: Qachon, Nima Uchun, Qanday Amalga Oshiriladi?". Central Asian Journal of Medical and Natural Science 4 (3), 947-55. <https://cajmns.centralasianstudies.org/index.php/CAJMNS/article/view/1602>.
16. Kadirov J. F. et al. NEUROLOGICAL COMPLICATIONS OF AIDS //Journal of new century innovations. – 2022. – T. 10. – №. 5. – C. 174-180.
17. Khamidov O. A., Shodmanov F. J. Computed Tomography and Magnetic Resonance Imaging Play an Important Role in Determining the Local Degree of Spread of Malignant Tumors in the Organ of Hearing //Central Asian Journal of Medical and Natural Science. – 2023. – T. 4. – №. 3. – C. 929-939.
18. Khamidov OA, Akhmedov YA, Ataeva SKh, Ametova AS, Karshiev BO Role of Kidney Ultrasound in the Choice of Tactics for Treatment of Acute Renal Failure. Central Asian journal of medical end natural sciences. 2021;2(4):132-134
19. Khamidov OA, Akhmedov YA, Yakubov DZh, Shodieva NE, Tukhtaev TI DIAGNOSTIC POSSIBILITIES OF USES IN POLYKYSTOSIS OF KIDNEYS. Web of scientist: International scientific research journal. 2021;2(8):27-33
20. Khamidov OA, Ataeva SKh, Ametova AS, Yakubov DZh, Khaydarov SS A Case of Ultrasound Diagnosis of Necrotizing Papillitis. Central Asian journal of medical end natural sciences. 2021;2(4):103-107
21. Khamidov OA, Ataeva SKh, Yakubov DZh, Ametova AS, Saytkulova ShR ULTRASOUND EXAMINATION IN THE DIAGNOSIS OF FETAL MACROSOMIA. Web of scientist: International scientific research journal. 2021;2(8):49-54
22. Khamidov OA, Khodzhanov IYu, Mamasoliev BM, Mansurov DSh, Davronov AA, Rakhimov AM The Role of Vascular Pathology in the Development and Progression of Deforming Osteoarthritis of the Joints of the Lower Extremities (Literature Review). Annals of the Romanian Society for Cell Biology, Romania. 2021;1(25):214 – 225
23. Khamidov OA, Mirzakulov MM, Ametova AS, Alieva UZ Multispiral computed tomography for prostate diseases. Central Asian journal of medical end natural sciences. 2021;2(2):9-11
24. Khamidov OA, Normamatov AF, Yakubov DZh, Bazarova SA Respiratory computed tomography. Central Asian journal of medical end natural sciences. 2021;2(2):1-8
25. Khamidov OA, Urozov UB, Shodieva NE, Akhmedov YA Ultrasound diagnosis of urolithiasis. Central Asian journal of medical end natural sciences. 2021;2(2):18-24
26. Khamidov OA, Yakubov DZh, Alieva UZ, Bazarova SA, Mamaruziev ShR Possibilities of Sonography in Differential Diagnostics of Hematuria. Central Asian journal of medical end natural sciences. 2021;2(4):126-131

27. Khamidov OA, Yakubov DZh, Ametova AS, Bazarova SA, Mamatova ShT Application of the Ultrasound Research Method in Otorhinolaryngology and Diseases of the Head and Neck Organs. *International Journal of Development and Public Policy*. 2021;1(3):33-37
28. Khamidov OA, Yakubov DZh, Ametova AS, Turdumatov ZhA, Mamatov RM Magnetic Resonance Tomography in Diagnostics and Differential Diagnostics of Focal Liver Lesions. *Central Asian journal of medical end natural sciences*. 2021;2(4):115-120
29. Khamidov Obid Abdurakhmanovich, Davranov Ismoil Ibragimovich, Ametova Alie Servetovna. (2023). The Role of Ultrasound and Magnetic Resonance Imaging in the Assessment of Musculo-Tendon Pathologies of the Shoulder Joint. *International Journal of Studies in Natural and Medical Sciences*, 2(4), 36–48. Retrieved from <https://scholarsdigest.org/index.php/ijsnms/article/view/95>
30. Khasanova Diyora Zafarjon kizi, Khamidov Obid Abdurakhmonovich and Juraev Kamoliddin Danabaeovich 2023. SYMPHYSIOPATHY AND PREGNANCY. "Conference on Universal Science Research 2023". 1, 2 (Feb. 2023), 55–60.
31. Khudayberdiyevich Z. S. et al. Possibilities and Prospects of Ultrasound Diagnostics in Rheumatology //Central Asian Journal of Medical and Natural Science. – 2022. – T. 3. – №. 5. – C. 570-582.
32. Mambetullaeva, S. M., G. N. Utemuratova, and S. Sh Yeshchanova. "ECOLOGICAL TRANSFORMATIONS IN THE SOUTHERN ARAL SEA REGION AS A FACTOR OF POPULATION DYNAMICS (ON THE EXAMPLE OF RHOMBOMYS OPIMUS AND ONDATRA ZIBETHICA)." *Annals of the Romanian Society for Cell Biology* (2021): 13428-13436.
33. N., Nurmurazayev Z., Abduqodirov Kh. M., and Akobirov M. T. 2023. "Transabdominal Ultrasound for Inflammatory and Tumoral Diseases Intestine: New Possibilities in Oral Contrasting With Polyethylene Glycol". *Central Asian Journal of Medical and Natural Science* 4 (3), 973-85. <https://cajmns.centralasianstudies.org/index.php/CAJMNS/article/view/1606>.
34. Nurmurazayev Z.N.; Suvonov Z.K.; Khimmatov I.Kh. Ultrasound of the Abdominal Cavity. *JTCOS* 2022, 4, 89-97.
35. O., Gaybullaev S., Fayzullayev S. A., and Khamrakulov J. D. 2023. "Cholangiocellular Cancer Topical Issues of Modern Ultrasound Diagnosis". *Central Asian Journal of Medical and Natural Science* 4 (3), 921-28. <https://cajmns.centralasianstudies.org/index.php/CAJMNS/article/view/1599>.
36. Obid, K., Servetovna, A. A., & Javlanovich, Y. D. (2022). Diagnosis and Structural Modification Treatment of Osteoarthritis of the Knee. *Central Asian Journal of Medical and Natural Science*, 3(5), 547-559.
37. P., Kim T., and Baymuratova A. C. 2023. "Fast Technology for Ultrasonic Diagnosis of Acute Coleculosis Cholecystitis". *Central Asian Journal of Medical and Natural Science* 4 (3), 940-46. <https://cajmns.centralasianstudies.org/index.php/CAJMNS/article/view/1601>.
38. Rustamov UKh, Shodieva NE, Ametova AS, Alieva UZ, Rabbimova MU US-DIAGNOSTICS FOR INFERTILITY. *Web of scientist: International scientific research journal*. 2021;2(8):55-61
39. Rustamov UKh, Urinboev ShB, Ametova AS Ultrasound diagnostics of ectopic pregnancy. *Central Asian journal of medical end natural sciences*. 2021;2(2):25-28
40. S., Usarov M., Turanov A. R., and Soqiev S. A. 2023. "Modern Clinical Capabilities of Minimally Invasive Manipulations under Ultrasound Control". *Central Asian Journal of Medical and Natural Science* 4 (3), 956-66. <https://cajmns.centralasianstudies.org/index.php/CAJMNS/article/view/1604>.
41. Usarov M.Sh, Otakulov Z.Sh and Rakhmonkulov Sh. H. 2022. Contrast-enhanced ultrasound in the differential diagnosis of focalnodular hyperplasia and hepatocellular liver adenoma. *Journal the Coryphaeus of Science*. 4, 4 (Dec. 2022), 70–79.

42. Yakubov , J., Karimov , B., Gaybullaev , O., and Mirzakulov , M. 2022. Ultrasonic and radiological picture in the combination of chronic venous insufficiency and osteoarthritis of the knee joints. *Academic Research in Educational Sciences*. 5(3), pp.945–956.
43. Yakubov D. Z., Gaybullaev S. O. The diagnostic importance of radiation diagnostic methods in determining the degree of expression of gonarthrosis //UZBEK JOURNAL OF CASE REPORTS. – С. 36.
44. Yakubov D.J., Turanov A.R. and Baymuratova A.C. 2022. Possibilities of contrast-enhanced ultrasound tomography in the diagnosis of metastatic liver lesions in patients with cervical cancer. *Journal the Coryphaeus of Science*. 4, 4 (Dec. 2022), 80–88.
45. Yakubov Doniyor Javlanovich, Juraev Kamoliddin Danabaevich, Gaybullaev Sherzod Obid ugli, and Samiev Azamat Ulmas ugli. 2022. “INFLUENCE OF GONARTHROSIS ON THE COURSE AND EFFECTIVENESS OF TREATMENT OF VARICOSE VEINS”. *Yosh Tadqiqotchi Jurnali* 1 (4):347-57.
46. Yeshchanova S. SH. and Panaeva A. N. 2022. CULTIVATION OF PUMPKIN CUCURBITA PEPO VARIETIES IN THE SOIL-CLIMATIC CONDITIONS OF KARAKALPAKSTAN. *Galaxy International Interdisciplinary Research Journal*. 10, 10 (Oct. 2022), 451–453.
47. Yeshchanova, S. "SH., Mambetullaeva SM Dynamics of Demographic Indicators during the Population Cycle *Microtus Ilaeus* in the Low of the Amudarya." *International Journal of Science and Research (IJSR)* 8.12 (2019): 911-912.
48. Yusufzoda Hosiyat Turon kizi, Khamidov Obid Abdurakhmonovich and Juraev Kamoliddin Danabaevich 2023. DIAGNOSIS OF CHANGES IN PREGNANT WOMEN WITH VULVOVAGINITIS. "Conference on Universal Science Research 2023". 1, 2 (Feb. 2023), 51–55.
49. Z., Umarmkulov Z., Khakimov M. B., and Suvonov Z. K. 2023. “Ultrasound Diagnostics and Diagnostics of Focal Liquid Lesions of the Liver”. *Central Asian Journal of Medical and Natural Science* 4 (3), 986-94. <https://cajmns.centralasianstudies.org/index.php/CAJMNS/article/view/1607>.
50. Ахмедов Якуб Амандуллаевич; Гайбуллаев Шерзод Обид угли; Хамидова Зиёда Абдивахобовна. МРТ В СРАВНЕНИИ С ДИАГНОСТИЧЕСКОЙ АРТРОСКОПИЕЙ КОЛЕННОГО СУСТАВА ДЛЯ ОЦЕНКИ РАЗРЫВОВ МЕНИСКА. *Tadqiqotlar* 2023, 7, 105-115.
51. Гайбуллаев Ш., Усаров М., Далерова М. НОРМАЛЬНЫЕ УЛЬТРАЗВУКОВЫЕ РАЗМЕРЫ ЖЕЛЧНОГО ПУЗЫРЯ И ОБЩЕГО ЖЕЛЧНОГО ПРОТОКА У НОВОРОЖДЕННЫХ // *Involta Scientific Journal*. – 2023. – Т. 2. – №. 1. – С. 142-148.
52. Ешчанова, Сайёра Шукурулла Кизи. "ОЦЕНКА ВЛИЯНИЯ ВНЕШНИХ И ВНУТРИПОПУЛЯЦИОННЫХ ФАКТОРОВ В ФОРМИРОВАНИЕ ДИНАМИКИ ЧИСЛЕННОСТИ И СТРУКТУРЫ ПОПУЛЯЦИИ *MICROTUS ILAEUS*." *Universum: химия и биология* 5-1 (95) (2022): 37-41.
53. Жавланович, Я. Д., Амандуллаевич, А. Я., Зафаржонович, У. З., & Павловна, К. Т. (2023). Мультипараметрическая МРТ В Диагностике Рака Предстательной Железы. *Central Asian Journal of Medical and Natural Science*, 4(2), 577-587. <https://doi.org/10.17605/OSF.IO/MQDHP>
54. Кадиров Ж. Ф. и др. МАГНИТНО-РЕЗОНАНСНАЯ ТОМОГРАФИЧЕСКАЯ ОЦЕНКА ПОРАЖЕНИЙ ЦЕНТРАЛЬНОЙ НЕРВНОЙ СИСТЕМЫ У БОЛЬНЫХ, ИНФИЦИРОВАННЫХ ВИРУСОМ ИММУНОДЕФИЦИТА ЧЕЛОВЕКА // *Journal of new century innovations*. – 2022. – Т. 10. – №. 5. – С. 157-173.
55. Нурмурзаев, З. Н., Жураев, К. Д., & Гайбуллаев, Ш. О. (2023). ТОНКОИГОЛЬНАЯ АСПИРАЦИОННАЯ ЦИТОЛОГИЯ ПОД УЛЬТРАЗВУКОВЫМ КОНТРОЛЕМ В ДИАГНОСТИКЕ ЗАБРЮШИННЫХ ОБРАЗОВАНИЙ: ИССЛЕДОВАНИЕ 85 СЛУЧАЕВ. *Academic Research in Educational Sciences*, 4(4), 126–133.

56. угли, А.С.Н., Хамидович, Р.Ш. and Данабаевич, Ж.К. 2023. Кость При Остеоартрите: Визуализация. *Central Asian Journal of Medical and Natural Science*. 4, 3 (Jun. 2023), 895-905.
57. угли, Н. З. Н., Шухратович, У. М., Хуршедовна, А. С. and Фаёзович, В. Ф. (2023) “Роль Ультразвука В Оценке Повреждения Мениска”, *Central Asian Journal of Medical and Natural Science*, 4(2), pp. 588-595. doi: 10.17605/OSF.IO/M5HZP.
58. угли, Химматов Ислон Хайрулло, Сувонов Зуфар Кахрамон угли, and Умаркулов Забур Зафаржонович. 2023. “Визуализация Множественной Миеломы”. *Central Asian Journal of Medical and Natural Science* 4 (3), 906-16. <https://cajmns.centralasianstudies.org/index.php/CAJMNS/article/view/1597>.
59. Хамидов , О. , Гайбуллаев , Ш. и Давранов , И. 2023. СРАВНЕНИЕ РЕЗУЛЬТАТОВ УЗИ И МРТ В ДИАГНОСТИКЕ ПОВРЕЖДЕНИЙ МЕНИСКА КОЛЕННОГО СУСТАВА. *Евразийский журнал медицинских и естественных наук*. 3, 4 (апр. 2023), 176–183.
60. Хамидов О. А., Гайбуллаев Ш. О., Хакимов М. Б. ОБЗОР МЕТОДОВ ОБРАБОТКИ ИЗОБРАЖЕНИЙ ДЛЯ ДИАГНОСТИКИ ПАТОЛОГИИ ГОЛОВНОГО МОЗГА: ПРОБЛЕМЫ И ВОЗМОЖНОСТИ // *Journal of new century innovations*. – 2022. – Т. 10. – №. 5. – С. 181-195.
61. Хамидов О. А., Гайбуллаев Ш. О., Хомидова Д. Д. РОЛЬ УЛЬТРАЗВУКА И МАГНИТНО-РЕЗОНАНСНОЙ ТОМОГРАФИИ В ОЦЕНКЕ МЫШЕЧНО-СУХОЖИЛЬНЫХ ПАТОЛОГИЙ ПЛЕЧЕВОГО СУСТАВА // *Uzbek Scholar Journal*. – 2023. – Т. 12. – С. 125-136.
62. Хамидов О.А. Оптимизация лучевой диагностики повреждений мягкотканых структур коленного сустава и их осложнений, *Американский журнал медицины и медицинских наук*. 2020;10 (11):881-884. (In Russ.)
63. Хамидов, О. А., Жураев, К. Д., & Муминова, Ш. М. (2023). СОНОГРАФИЧЕСКАЯ ДИАГНОСТИКА ПНЕВМОТОРАКСА. *World scientific research journal*, 12(1), 51-59.
64. Ходжибеков М.Х., Хамидов О.А. Обоснование ультразвуковой диагностики повреждений внутрисуставных структур коленного сустава и их осложнений. 2020;3(31):526-529. (In Russ.)
65. Юсуфзода Х. и др. ОПТИМАЛЬНЫЕ МЕТОДЫ ДИАГНОСТИКИ СИНДРОМА МИРИЗЗИ // *Yangi O'zbekiston talabarlari axborotnomasi*. – 2023. – Т. 1. – №. 2. – С. 21-25.
66. Якубов Д. Д., Давранов И. И., Шодикулова П. Ш. ХАРАКТЕРИСТИКИ МСКТ И ДИАГНОСТИЧЕСКАЯ ЦЕННОСТЬ COVID-19 ПРИ БЕРЕМЕННОСТИ // *Journal of new century innovations*. – 2023. – Т. 22. – №. 1. – С. 165-176.
67. Якубов Д. Ж., Гайбуллаев Ш. О. Влияние посттравматической хондропатии на функциональное состояние коленных суставов у спортсменов. *Uzbek journal of case reports*. 2022; 2 (1): 36-40. – 2022.