MICRO LABS LIMITED

ORTHO NEWSCAST

Volume 5 | Issue 34 | 2024

Dear Doctor,

Greetings from Micro Labs. We are happy to bring you "**Ortho Newscast"** which contains latest and interesting news in the field of Orthopaedics.

This issue contains

- **Efficacy and safety of total knee arthroplasty with robotic arm assistance**
- **A Retrospective Study on the Predictive Value of Combined Systemic Immune-Inflammatory Index (SII) and Geriatric Nutritional Risk Index (GNRI) for Survival in Elderly Patients with Hip Fractures**
- **Preliminary Outcomes of of 3D-printed patient-specific titanium radial head (RH) prosthesis in treatment of the irreparable RH fractures**
- **Case report on Intraneural Ulnar Nerve Ganglion in the Forearm**

Should you require any specific article or medical information, please feel free to contact us at **medicalservices@microlabs.in**

Looking forward to your valuable feedback

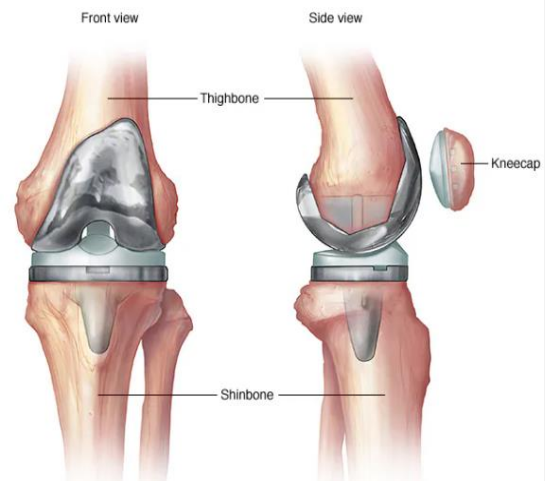
Best Regards,

Medical Team, Micro Labs Limited

ORTHO NEWSCAST
Volume 5 | Issue 34 | 2024

Efficacy and safety of total knee arthroplasty with robotic arm assistance

INTRODUCTION



KNEE REPLACEMENT

In contrast to cmTKA, raTKA using the YUANHUA robot not only spares patients further pain and damage but also offers improved functional recovery, more precision in prosthesis positioning, and improved restoration of axial alignment.

Total knee arthroplasty (TKA) stands as the predominant surgical intervention for treating end-stage knee diseases. Despite notable advancements in prosthesis design, surgical methodologies, and postoperative rehabilitation strategies over the last twenty years, approximately 10%–20% of patients continue to experience dissatisfaction post conventional manual (cmTKA) TKA. This dissatisfaction often stems from issues such as improper prosthesis positioning, inaccurate alignment recovery, and delayed functional rehabilitation.[1] Computer navigation-assisted surgery has emerged as a method to enhance the precision of osteotomy procedures, with data primarily sourced from patients in America and Europe, rather than Asia. In 2020, the Chinese National Medical Products Administration authorized the clinical use of the YUANHUA-TKA semi-active robotic arm system. When compared to MAKO, YUANHUA-TKA offers several advantages. Notably, its robotic arm boasts a smaller volume, optimizing space utilization in the operating room and providing surgeons with increased maneuverability. Additionally, YUANHUA-TKA's robotic arm features an additional axis, enhancing operational flexibility. However, prior to this study, the safety and efficacy of the YUANHUA-TKA robot had not been thoroughly investigated or validated. The authors observed a preference among studies on robotic-assisted TKA (raTKA) for focusing on imaging assessments, such as angle and axis evaluations, rather than concurrently examining clinical outcomes and adverse effects.[2] Hence, this study aimed to (i) assess the effectiveness and safety of raTKA utilizing the YUANHUA-TKA system in patients, and (ii) compare the benefits of raTKA against cmTKA by examining postoperative pain, functional outcomes, imaging assessments, and physical trauma experienced by patients who underwent either procedure.

METHODS

A prospective, randomized, single-blind trial conducted between October 2020 and December 2020, 60 patients undergoing primary unilateral TKA were randomly allocated to receive either raTKA or cmTKA. The clinical evaluation, which encompassed parameters such as osteotomy and prosthesis model testing duration, total operation time, visual analogue scale (VAS) scores

at rest and in motion, opioid consumption, white blood cell count, neutrophil ratio, erythrocyte sedimentation rate, C-reactive protein (CRP) levels, passive and active range of motion (pROM, aROM), Western Ontario and McMaster Universities Arthritis Index (WOMAC) score (assessing stiffness, pain, and function), gait analysis, knee society score (KSS), adverse events, and blood loss, was conducted by the project nurse. Imaging evaluation included measurements of lateral tibia component angle (LTC), frontal femoral component angle, frontal tibia component angle (FTC), lateral femoral component angle, and hip–knee–ankle angle (HKA). Statistical analyses involved the use of the student t-test (or Wilcoxon signed-rank test) and the $\chi 2$-test (or Fisher exact test) to determine differences in categorical variables.

RESULTS

In stage I, all incisions healed without complications, and no operation-related issues were encountered. There were no significant differences observed between the raTKA and cmTKA groups regarding WOMAC pain scores, rest VAS (rVAS), motion VAS (mVAS), or opioid consumption throughout the perioperative and follow-up periods ($p>0.05$). Likewise, there were no significant disparities between the groups in terms of white blood cell count (WBC) or neutrophil ratio. However, on the third postoperative day, the cmTKA group exhibited a significantly higher erythrocyte sedimentation rate (59.3 ± 14.1 mm/h) compared to the raTKA group (50.4 ± 15.7 mm/h) ($p=0.02$), as well as a higher CRP level (79.7 ± 17.4 mg/L in cmTKA vs. 70.4 ± 16.8 mg/L in raTKA; $p=0.04$). Although no significant differences were noted in WOMAC stiffness scores or pROM, the raTKA group exhibited significantly superior aROM and flexion range during walking (FRW) throughout the trial ($p<0.05$) (Table 1). Additionally, the KSS at the 1-month follow-up and the WOMAC function score at the 1-year follow-up were significantly higher in the raTKA group ($p<0.05$). Until the 1-year follow-up, neither group experienced any instances of dislocation or loosening. The hip–knee–ankle angle (HKA), LTC, frontal femoral component angle (FFC), FTC, and lateral femoral component angle (LFC) remained consistent across different time points. However, the HKA and LTC in the raTKA group were closer to the ideal angle, with a significant difference between the groups ($p<0.05$).

Table 1. Assessment of function (mean [SD])

Outcome	raTKA (n = 28)	cmTKA (n = 32)	p value
pROM (°)			
First month	104.82 (9.08)	102.03 (6.70)	0.18
Third month	107.10 (10.97)	105.00 (10.91)	0.52
1 year	115.10 (8.73)	114.00 (6.34)	0.76
aROM (°)			
First month	101.82 (7.10)	97.03 (10.5)	0.046*
Third month	105.10 (6.84)	101.07 (7.23)	0.03*
1 year	110.82 (7.42)	106.05 (7.88)	0.02*
KSS (score)			
First month	66.21 (11.76)	60.72 (9.13)	0.048*
Third month	80.42 (12.37)	77.21 (11.35)	0.30
1 year	91.48 (7.62)	90.21 (8.22)	0.60
FRW (°)			
First month	40.2 (10.71)	34.5 (9.63)	0.03*
Third month	46.21 (9.66)	38.41 (10.94)	0.003*
1 year	48.73 (8.10)	43.17 (8.55)	0.01*

Abbreviations: aROM, active range of motion; FRW, flexion range when walking; KSS, keen society score; pROM, passive range of motion.; * Indicates a significant difference.

DISCUSSION

In this study, the author discovered that raTKA utilizing the YUANHUA-TKA robot, when compared to cmTKA, not only mitigates additional pain or trauma in patients but also holds the potential for enhanced functional recovery and improved accuracy in prosthesis positioning and axial alignment reconstruction. Onggo JR et al. conducted an investigation involving 2234 robotic TKA (rTKA) and 4300 conventional TKA (cTKA) cases across seven studies, revealing that both rTKA and cTKA procedures were reliable and safe. However, rTKA demonstrated the capability to achieve superior alignment across multiple axes and lower mean blood loss, potentially leading to slightly improved clinical outcomes compared to cTKA.[3] Kort et al. discovered that robotic assistance could enhance clinical scores, particularly the WOMAC function score and KSS, to a greater extent than manual TKA.[4]

CONCLUSION

In contrast to cmTKA, raTKA utilizing the YUANHUA robot not only prevents additional pain and trauma in patients but also ensures superior functional recovery and enhances the precision of prosthesis positioning and axial alignment reconstruction.

REFERENCE

1. Goh GS, Liow MHL, Bin Abd Razak HR, Tay DK, Lo NN, Yeo SJ. Patient-Reported Outcomes, Quality of Life, and Satisfaction Rates in Young Patients Aged 50 Years or Younger After Total Knee Arthroplasty. J Arthroplasty. 2017 Feb;32(2):419-425.
2. Yuan M, Ling T, Su Q, Wan X, Lai Y, Zhou Z. Safety and Effectiveness of Robotic-Arm Assisted Total Knee Arthroplasty. Orthop Surg. 2024 Apr;16(4):882-893.
3. Onggo JR, Onggo JD, De Steiger R, Hau R. Robotic-assisted total knee arthroplasty is comparable to conventional total knee arthroplasty: a meta-analysis and systematic review. Arch Orthop Trauma Surg. 2020 Oct;140(10):1533-1549.
4. Kort N, Stirling P, Pilot P, Müller JH. Robot-assisted knee arthroplasty improves component positioning and alignment, but results are inconclusive on whether it improves clinical scores or reduces complications and revisions: a systematic overview of meta-analyses. Knee Surg Sports Traumatol Arthrosc. 2022 Aug;30(8):2639-2653.

A Retrospective Study on the Predictive Value of Combined Systemic Immune-Inflammatory Index (SII) and Geriatric Nutritional Risk Index (GNRI) for Survival in Elderly Patients with Hip Fractures

INTRODUCTION

Hip fractures significantly affect the physical and mental well-being of elderly individuals, with complications from underlying conditions exacerbating their situation. Surgery is often the

For senior patients with hip fractures who have had surgery, the SII-GNRI score is useful in predicting their 1-year survival rate.

preferred treatment to restore their daily functioning and prevent complications associated with prolonged immobility. Preoperative factors such as hemoglobin levels, nutritional status, immune function, muscle mass loss, and inflammatory responses can increase the risk of postoperative complications, leading to longer hospital stays, reduced quality of life, and higher mortality rates. Malnutrition has been historically prevalent among elderly patients due to inadequate caloric intake and metabolic changes, further complicating their recovery. Research consistently links immunoinflammatory factors with poorer outcomes and increased postoperative complications in hip fracture patients. Noteworthy parameters like the neutrophil–lymphocyte ratio (NLR), platelet–lymphocyte ratio (PLR), and monocyte–lymphocyte ratio (MLR) have been extensively studied in this context.[1] The Systemic Immunoinflammatory Index (SII) is a modern tool for assessing inflammation, calculated from levels of neutrophils, platelets, and lymphocytes in the bloodstream. It offers valuable insights into various inflammatory and immune processes within the body. Notably, compared to other metrics like the platelet-to-lymphocyte ratio and neutrophil-to-lymphocyte ratio, the SII is known for its greater stability and reliability.[2] The Geriatric Nutritional Risk Index (GNRI) was commonly employed to evaluate the nutritional health and predict outcomes in elderly individuals. Traditionally, it has been based on simple measurements such as weight, height, and serum albumin levels.[3] Both the Systemic Immune-inflammatory Index (SII) and the GNRI have been extensively studied and validated for predicting outcomes across various medical conditions. However, the potential relationship between utilizing both GNRI and SII metrics together and the occurrence of hip fractures remains to be clarified.[1] The objective of this study was to investigate whether combining SII and GNRI scores serves as an independent prognostic factor for elderly patients diagnosed with hip fractures.

METHODS

In this retrospective cohort study, 597 patients diagnosed with hip fractures, including femoral neck and intertrochanteric femur fractures, were included. The study criteria comprised individuals aged 60 years or older, with fractures resulting from falls no higher than standing height, occurring within two weeks. Detailed demographic data, experimental variables, and postoperative complications were systematically documented. The GNRI and SII were accurately calculated. Receiver operating characteristic (ROC) curves were constructed to determine optimal cutoff values for each parameter. Subsequently, a multivariate Cox regression analysis was conducted to evaluate the predictive capability of the combined SII–GNRI score for 1-year postoperative mortality in elderly patients with hip fractures.

RESULTS

In the Cox regression unifactor analysis, various factors such as advanced age (≥80 years), a Charlson Comorbidity Index (CCI) greater than 2, fracture site, presence of heart or brain diseases, anemia, prolonged hospitalization, blood transfusion, an ASA score greater than 2, GNRI values of 579.39 or lower, SII values of 1621.92 or higher, low albumin levels, low body weight, and a high SII–GNRI score (2–3) were significantly linked to increased 1-year

mortality rates. In the multivariate analysis, significant factors included an SII–GNRI score of 3, extended hospital stays, CCI greater than 2, blood transfusion, and an SII–GNRI score of 2, all emerging as risk factors for 1-year mortality in elderly hip fracture patients (P<0.05). These findings were reinforced by Kaplan–Meier curve analysis using the log-rank test, illustrating a higher mortality rate among patients with elevated combined SII and GNRI scores (Figure 1), indicating a poorer prognosis, particularly in elderly patients with high SII and low GNRI. Moreover, among the 98 patients who experienced postoperative complications (POCs), including pulmonary infections, deep vein thrombosis, postoperative delirium, acute cerebral infarction, acute myocardial infarction, urinary tract infections, wound infections, and pulmonary thromboembolism, a significantly higher incidence of POCs was observed in patients with high SII–GNRI scores compared to those with lower scores (p=0.001).

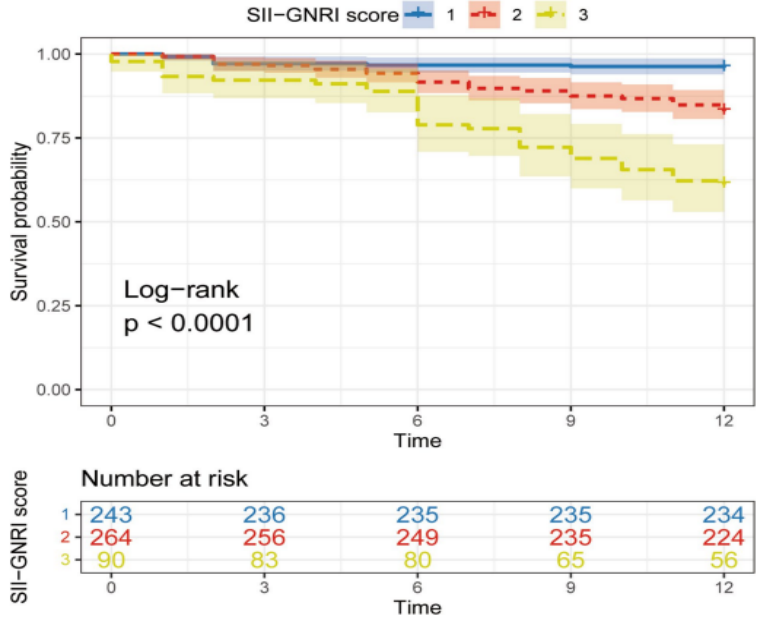


Figure 1. Kaplan-Meier survival studies based on SII-GNRI score for older hip fracture patients. The 95% confidence interval (CI) was indicated by the shaded regions. The numbers below the Kaplan-Meier survival curves represent the number of patients at risk for each group at a given month.

DISCUSSION

The current study highlighted the significance of the SII–GNRI score in forecasting the 1-year survival rate in elderly hip fracture patient's post-surgery. Findings from Funahashi et al. indicated that GNRI-based nutritional assessment effectively predicts 30-day mortality in geriatric patients undergoing hip fracture surgery. GNRI emerged as a straightforward yet precise tool for assessing mortality risk following hip fracture surgery.[4] Study indicated a correlation between SII levels and increased all-cause mortality among older adults undergoing surgery for hip fractures.[5]

CONCLUSION

This study underscores the significance of the combined SII–GNRI score, especially when SII levels were equal to or greater than 1621.92 and GNRI values are 579.39 or lower. This composite score proves to be a robust predictor of one-year survival outcomes among elderly individuals undergoing hip fracture surgery. It demonstrated potential utility in preoperative patient evaluation and guiding treatment decisions for this patient population.

REFERENCE

1. Zhou L, Huang C, Zhu X, Ma Z. Combined Systemic Immune-inflammatory Index (SII) and Geriatric Nutritional Risk Index (GNRI) predict survival in elderly patients with hip fractures: a retrospective study. J Orthop Surg Res. 2024 Feb 6;19(1):125.

2. Wang Q, Zhu D. The prognostic value of systemic immune-inflammation index (SII) in patients after radical operation for carcinoma of stomach in gastric cancer. J Gastrointest Oncol. 2019 Oct;10(5):965-978.

3. Funamizu N, Sakamoto A, Utsunomiya T, Uraoka M, Nagaoka T, Iwata M, Ito C, Tamura K, Sakamoto K, Ogawa K, Takada Y. Geriatric nutritional risk index as a potential prognostic marker for patients with resectable pancreatic cancer: a single-center, retrospective cohort study. Sci Rep. 2022 Aug 11;12(1):13644.

4. Funahashi H, Morita D, Iwase T, Asamoto T. Usefulness of nutritional assessment using Geriatric Nutritional Risk Index as an independent predictor of 30-day mortality after hip fracture surgery. Orthop Traumatol Surg Res. 2022 Sep;108(5):103327.

5. Wang ZC, Jiang W, Chen X, Yang L, Wang H, Liu YH. Systemic immune-inflammation index independently predicts poor survival of older adults with hip fracture: a prospective cohort study. BMC Geriatr. 2021 Mar 4;21(1):155.

Preliminary Outcomes of of 3D-printed patient-specific titanium radial head (RH) prosthesis in treatment of the irreparable RH fractures

INTRODUCTION

It is safe to implant the patient-specific titanium RH prosthesis created by 3D printing, and it might be a viable therapy for irreversible RH fractures.

Radial head fractures constitute approximately 33% of all elbow fractures. Increasing evidence underscores the pivotal role of the radial head in maintaining normal elbow joint function, with numerous complications arising post-resection. Precise management of radial head fractures is paramount. Presently, commercially available radial head prostheses of fixed sizes were frequently utilized for replacement. However, challenges such as prosthesis-material mismatch have led to a multitude of complications.[1] With the progress of computer-aided design (CAD) and 3D printing technology, patient-specific prostheses are now readily available. Leveraging the symmetry of the human skeleton, 3D images of a healthy radial head can be mirrored to fabricate a prosthesis for the contralateral side, ensuring precise shape and dimensions for the replacement. Furthermore, 3D preoperative planning enabled the creation of intraoperative guides, facilitating accurate positioning of the prosthesis during implantation.[2] This study focused on the development and utilization of a 3D-printed patient-specific titanium prosthesis accompanied by a customized intraoperative cutting guide for managing irreparable radial head fractures. The primary aim was to present the initial clinical outcomes and assess the safety of this prosthesis.

METHODS

This multi-center prospective clinical trial enrolled 10 participants (6 men and 4 women) with a mean age of 41 years (ranging from 25 to 64 years). Inclusion criteria comprised individuals aged 18 or older, diagnosed with Mason type III/IV irreparable radial head fracture, and possessing a normal contralateral elbow. Of the cases, 3 were categorized as Mason type III, while 7 were type IV. Preoperative and postoperative assessments included clinical and functional evaluations, radiographic examinations, and laboratory blood and urine analyses. The clinical and functional assessments, encompassing elbow range of motion (ROM), visual analog scale (VAS) score, Disabilities of the Arm, Shoulder and Hand (DASH) score, and Mayo Elbow Performance Score (MEPS), were conducted before surgery and at 6, 12, 24, 36, and 48 weeks postoperatively.

RESULTS

The prostheses were implanted with cemented stems in 5 patients and cementless stems in 5 patients, showing good congruency intraoperatively with the capitellum and radial notch of the ulna in all cases. Clinical and functional outcomes showed improvement in all patients' ROM, VAS score, DASH score, and MEPS during postoperative follow-ups. At the final follow-up, mean values for elbow extension, flexion, supination, and pronation were within functional ranges. The mean VAS score, DASH score, and MEPS also demonstrated favorable outcomes. Comparative analysis between the cemented and cementless groups revealed similar clinical and functional outcomes. Radiographic examinations postoperatively revealed no evidence of subsequent complications such as capitellar erosion, implant failure, malpositioning, or overstuffing. Ossification was observed around the radial neck and ulnohumeral joint in some cases, while radiolucent lines were detected around stems in a few instances. Proximal radial neck resorption was noted in two cases (patients 2 and 3) (Figure 1(a)–(c)). One patient developed heterotopic ossification (HO) with limited pronation, while another patient with proximal radial neck resorption had slightly reduced flexion. Laboratory results remained stable, and no adverse events related to the 3D-printed prosthesis implantation were reported.

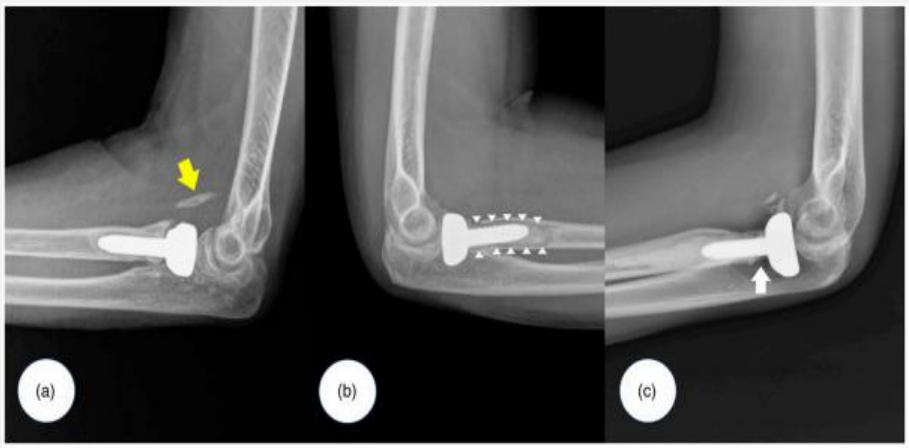


Figure 1. Radiographic results following surgery. (a) Heterotopic ossification (patient 9; yellow arrow). (b) Radiolucency at the contact between bone and cement (white arrow heads) in patient 10. (c) Patient 3's proximal radial neck resorption (white arrow).

DISCUSSION

The study showed that utilizing a 3D-printed patient-specific titanium radial head prosthesis was safe and offered a promising treatment option for irreparable radial head fractures. Luenam et al. concluded that a custom radial head implant crafted through 3D printing technology yields satisfactory functional outcomes, presenting a

viable solution for addressing chronic persistent elbow instability associated with irreparable radial head injuries.[3] Titanium was frequently selected as the material for various orthopedic implants due to its outstanding biocompatibility and mechanical characteristics. Instances of titanium toxicity were uncommonly documented.[4]

CONCLUSION

Results from this preliminary study, encompassing clinical, radiographic, and laboratory assessments, indicated that implanting the 3D-printed patient-specific titanium radial head prosthesis was a safe approach and holds promise as a treatment option for irreparable radial head fractures.

REFERENCE

1. Zhang C, Chen H, Fan H, Xiong R, Huang C, Peng Y, Lin Y, Wang F, Duan X, Yang L. Radial head replacement using personalized 3D printed porous tantalum prosthesis. Journal of Materials Research and Technology. 2022 Sep 1;20:3705-13.

2. Luenam S, Kosiyatrakul A, Charoenlap C, Puncreobutr C, Lohwongwatana B. Radial head replacement with the 3D-printed patient-specific titanium prosthesis: Preliminary results of a multi-centric prospective study. J Orthop Surg (Hong Kong). 2024 Jan-Apr;32(1):10225536241236806.

3. Luenam S, Kosiyatrakul A, Hansudewechakul C, Phakdeewisetkul K, Lohwongwatana B, Puncreobutr C. The patient-specific implant created with 3D printing technology in treatment of the irreparable radial head in chronic persistent elbow instability. Case reports in orthopedics. 2018 Oct 23;2018:9272075.

4. Kim KT, Eo MY, Nguyen TT, Kim SM. General review of titanium toxicity. International journal of implant dentistry. 2019 Dec;5:1-2.

Case report on Intraneural Ulnar Nerve Ganglion in the Forearm

INTRODUCTION

A cystic tumour around a nerve may be differentially diagnosed as an intraneural ganglion. Radical techniques, such basic decompression, were preferred for surgery.

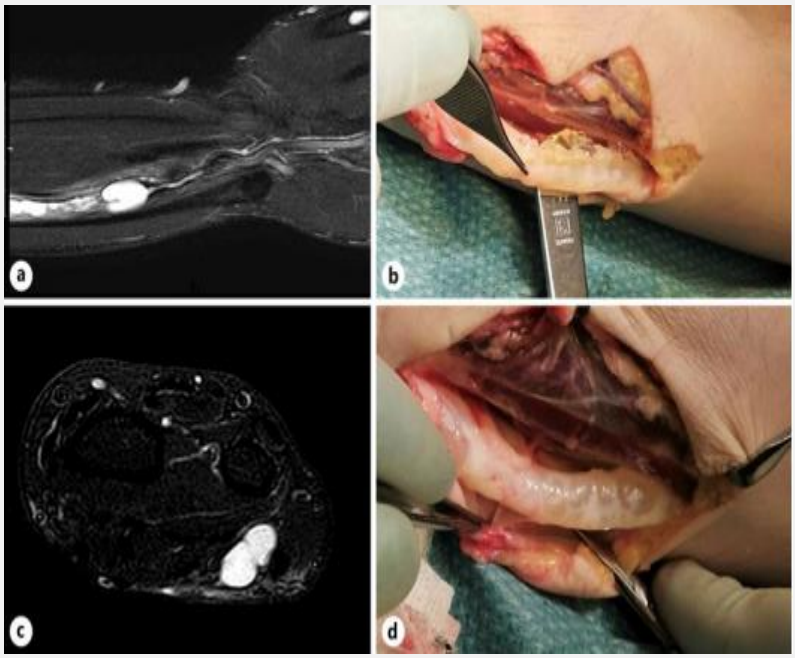
Intraneural ganglion cysts, benign mucinous lesions of peripheral nerves, originated from the epineurium and can lead to compression neuropathy in extremities. While they commonly affect the ulnar nerve and its branches in upper extremities, occurrences involving the superficial branch of the ulnar nerve are unprecedented. Unlike extraneural ganglion cysts, which are familiar, intraneural variants remain rare and poorly understood among surgeons. Various theories on their pathogenesis exist, with the articular (synovial) theory being the most recent and widely accepted explanation.[1] Various surgical approaches have been suggested for intraneural

ganglion cyst removal, yet outcomes have been unsatisfactory with a potentially underreported high recurrence rate. The challenge was exacerbated by the fact that only about one-third of ulnar intraneural ganglions involve a branch, complicating surgical intervention. Surgeons must consider the significant recurrence risk when deciding on the appropriate course of action. It was important to note that ganglion cysts were pseudocysts lacked a true lining, distinguishing them from cystic lesions with linings like posttraumatic neuroma, cystic lymphangioma, perineurial/Tarlov cyst, and cystic metastasis of neuroendocrine tumor.[2]

CASE PRESENTATION

A 53-year-old man presented with worsening numbness and decreased hand strength on the ulnar aspect of his left hand. Initially treated for suspected ulnar nerve compression in Guyon's canal with open nerve release surgery, cystic changes in the ulnar nerve were observed and the wound was closed. Subsequently, an Magnetic resonance imaging (MRI) revealed an intraneural ganglion (Figure 1a), indicating a clear disparity in 2-point discrimination and strength between the affected left hand and the unaffected right hand. Surgical excision was performed due to the patient's progressively worsening symptoms, revealing an intraneural ganglion exceeding 10 cm in length within the ulnar nerve in the forearm (Figure 1b, c). Following surgery, the patient became symptom-free with no neurological deficits. Microscopic analysis depicted a dense collagenous wall surrounding areas of myxoid degeneration and stellate myofibroblasts within the cyst, devoid of a true epithelial lining and showing no cytologic atypia or mitotic activity (Figure 1d). However, symptoms recurred 18 months later, with a new MRI confirming ganglion recurrence without identification of an articular branch. Another surgical attempt was made due to ongoing clinical deterioration, with the cyst being meticulously removed to avoid nerve damage following decompression. Pathological examination of the ganglion tissue revealed residual myxoid degeneration and cyst formation within the nerve. Immunohistochemical testing confirmed the presence of the mesothelial and perineural marker EMA in the cyst wall but not on its surface, ruling out Tarlov cyst and mesothelial cyst. Additionally, the lymphendothelial marker D2–40 was negative on the cyst surface, excluding cystic lymphangioma. The patient was clinically monitored for 3 months postoperatively,

Figure 1. a, c Preoperative magnetic resonance imaging. b, d Results of the first surgery.



demonstrating normal neurological findings, including equal 2-point discrimination in all digits and improved strength, with no signs of recurrence.

DISCUSSION

A 53-year-old man presented with worsening numbness and diminished hand strength in the ulnar aspect of his left hand. An MRI revealed the presence of an intraneural ganglion, prompting surgical intervention due to the patient's deteriorating symptoms. Despite initial relief, symptoms recurred 18 months later, with a subsequent MRI confirming ganglion recurrence. Another surgical procedure was performed to remove the ganglion, and immunostains on paraffin sections were used to rule out alternative diagnoses such as synovial cyst, posttraumatic neuronal cyst, Tarlov cyst, mesothelial cyst, and cystic lymphangioma. Three months postoperatively, the patient was free of symptoms and displayed normal neurological findings during follow-up.[2] The limited number of cases in the literature makes it statistically challenging to confirm whether surgically targeting the articular branch is a sufficient treatment for intraneural ganglion in the ulnar nerve. However, it's apparent from existing literature that only a minority of cases of intraneural ganglions in the ulnar nerve involve an articular branch, despite surgeons' increased vigilance in seeking it out. This suggests that alternative treatment approaches may be necessary for the majority of cases. Additionally, diagnosing a ganglion cyst relies on excluding other possibilities, as it is a pseudocyst without a lining. When histological sections do not reveal a distinct lining, a presumptive diagnosis of ganglion cyst was typically made.[3] In routine practice, paraffin immunostains were not commonly conducted in such cases. Cystic lesions found within the nerve encompass posttraumatic neural cysts, Tarlov cysts, mesothelial cysts, and cystic lymphangiomas. For instance, Gonzalez documented a case of an intraneural lymphatic cyst affecting the ulnar nerve within the Guyon canal.[4] Various cystic formations not only exhibit diverse pathogenic origins but also present differing clinical trajectories and recurrence risks. It was worth noting that not all intraneural cysts possess articular branches, as not all of them were intraneural ganglions. Immunostains can serve as valuable tools to confirm the diagnosis of intraneural ganglion cysts.

CONCLUSION

Intraneural ganglion should be included in the list of possible diagnoses for any cystic mass near a nerve. In surgical management, the authors advocate for less aggressive approaches, such as straightforward decompression. Despite potentially higher recurrence rates, their experience suggested that the benefits, including a reduced likelihood of neurological deficits, outweigh the potential drawbacks. Opting for minimal surgical interventions also facilitates any future reoperations, as excessive scar tissue poses a heightened risk of nerve damage during subsequent procedures.

REFERENCE

1. Öztürk U, Salduz A, Demirel M, Pehlivanoğlu T, Sivacioğlu S. Intraneural ganglion cyst of the ulnar nerve in an unusual location: A case report. Int J Surg Case Rep. 2017;31:61-64.

2. Reiser D, Szallasi A, Sagerfors M. Intraneural Ulnar Nerve Ganglion: A Surgical Case Report of a 10-cm-Long Recurring Ganglion Cyst in the Forearm. Case Reports in Orthopedic Research. 2023 Jan 10;6(1):39-44.

3. Yunga Tigre J, Maddy K, Errante EL, Costello MC, Steinlauf S, Burks SS. Recurrent Peroneal Intraneural Ganglion Cyst: Management and Review of the Literature. Cureus. 2023 May 2;15(5):e38449.

4. González Pérez I, Corella Montoya F, Casado Fariñas I. Intraneural microcystic lymphatic malformation of the ulnar nerve at the Guyon canal: Unusual cause of ulnar pain in a child. Orthop Traumatol Surg Res. 2017 Jun;103(4):513-515.