

# A Merkel cell carcinoma case with high but preventable morbidity

Glenn Kolansky<sup>1</sup>, Zach Kolansky<sup>2</sup>

<sup>1</sup>Medical Director of Advanced Dermatology Surgery and Laser Center & Assistant Clinical Professor of Hackensack Meridian School of Medicine, Nutley, NJ, USA. & Double Board Certified in Dermatology and Mohs Micrographic Surgery, <sup>2</sup>Graduate of Tulane University School of Medicine, New Orleans, LA, USA

**Corresponding author:** Zach Kolansky, MD, E-mail: zacharykolansky@gmail.com

## ABSTRACT

Merkel cell carcinoma (MCC) is a rare and aggressive neuroendocrine tumor that grows rapidly and metastasizes early. Typically, MCC presents as an erythroscaly papule but may vary in morphology, possessing etiologies consistent with UV exposure and Merkel cell polyomavirus (MCPyV) infection. Biopsy-driven histopathologic and immunohistochemical analysis are necessary for diagnosis. We present an original case of MCC overlying a recent arthroplasty and morbidities from combined factors. A 75-year-old patient with a recent total arthroplasty presented with an erythematous and hyperkeratotic nodule which was asymptomatic and previously diagnosed by an orthopedist as a Baker's cyst. Biopsy results showed MCC, yielding treatment modality including but not limited to surgery and radiation therapy. The patient experienced a chronically-open wound and radiation contracture, ultimately leading to above-the-knee amputation. This case emphasizes the importance of early evaluation of suspicious lesions by a dermatologist and the necessity of clinical considerations when MCC arises near prosthetic joints.

**Key words:** Merkel cell carcinoma, Total arthroplasty, Radiation contracture, Baker's cyst, Surgical site infection

## INTRODUCTION

Merkel cell carcinoma (MCC) is a rare and aggressive neuroendocrine tumor that commonly originates in the stratum basale. Depending on the source, MCC has a 5-year survival rate that ranges between 36 to 65% in men and 47-84% in women [1]. MCC lesions often present as an erythroscaly papule [2]. However, MCC can present as a papule or nodule of any morphology. Etiology of MCC is related to cumulative DNA damage from UV radiation. In some MCC's, the Merkel cell polyomavirus (MCPyV) has integrated into damaged Merkel cells, and the virus has an oncogenic role in MCC proliferation. The MCPyV is a ubiquitous virus that does not typically integrate into the host genome and instead replicates in the nucleus [2]. Risk factors for MCC include age (70+), significant UV exposure, and immunocompromised status [1].

Histopathology and immunohistochemistry are central to the diagnosis of MCC. Specimens of MCC contain a blue basaloid dermal proliferation arranged in nodules, or sheets between reticular dermal collagen bundles. At low-power, MCC does not have peripheral palisading cells, a useful characteristic to distinguish it from Basal cell carcinoma (BCC). At high power, MCC consists of uniform round blue cells with minimal cytoplasm, numerous mitoses, and a stippled ("salt and pepper") pattern in the nuclei characteristic of other neuroendocrine tumors. Merkel cell carcinoma is almost always positive for CK20 and lymphovascular invasion (LVI), whereas BCC is CK20 negative without LVI. Finally, MCC is often positive for synaptophysin, chromogranin, and neurofilament protein [3].

We present a case of complications with a recent total arthroplasty from coincident treatment of Merkel cell carcinoma via radiation therapy.

**How to cite this article:** Kolansky G, Kolansky Z. A Merkel cell carcinoma case with high but preventable morbidity. Our Dermatol Online. 2026;17(2):234-237.

**Submission:** 10.06.2025; **Acceptance:** 13.11.2025

**DOI:** 10.7241/ourd.20262.18

## CASE REPORT

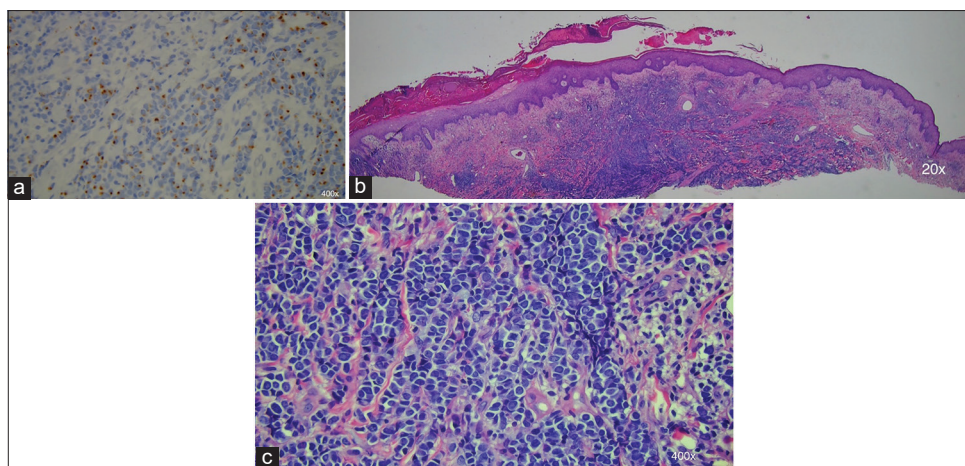
On September 30, 2020, a 75-year-old woman visited the dermatologist with a complaint that a growth on her left knee was enlarging for 3 months. The patient was previously reassured by her orthopedist that the growth of concern appeared to be a Baker's cyst, and there was no need to be concerned. Clinical examination showed it to be an erythematous and hyperkeratotic nodule. On July 17, 2020, 2 months prior to this visit, she underwent a total left knee arthroplasty. At the time, medical history was significant for DM (HbA1c-7), hypertension, ½ a pack of cigarettes a day for 53+ years, hyperlipidemia, and degenerative joint disease. Since the surgery, she could not ambulate because she could not straighten her leg and had 10/10 pain despite use of 5mg oxycodone 2-3 times per day. She underwent a biopsy for the lesion, measuring 6.5 cm x 5.5 cm (Fig. 1).

The biopsy results (Figs. 2a - 2c) showed Merkel cell carcinoma (MCC) that was positive for pan-cytokeratin, CK20, synaptophysin, and chromogranin. Immunohistology analysis showed characteristic blue sheets of cells with aggregates that intercalate between reticular collagen bundles (Fig. 2a). Histopathology showed that the neoplastic cells broadly extended to the base of the specimen with a Breslow thickness greater than 3mm (Fig. 2b). Further characterization of the cells as having small and rounded size and shape, granular and scant cytoplasm, and high rate of mitosis further corroborated the diagnosis of MCC (Fig. 2c) [4].

On October 13, 2020, a PET scan showed an avid soft tissue mass overlying the left lateral tibia and fibula without bony destruction, consistent with primary malignancy. Additionally, the scan demonstrated no avid nodal metastasis, and a right parotid mass. The parotid mass was worked up and was later diagnosed as Warthin's parotid tumor, unrelated to MCC. The patient consulted with oncology and radiation oncology in the following weeks and experienced multiple falls in part from her leg disability with nuances of surgery, radiation, and immunotherapy discussed. Ultimately, surgical options were ruled out by the patients due to significant morbidity risk and radiation therapy was opted for; the patient never followed through with discussion of immunotherapy. The physician team noted among themselves that radiation would be



**Figure 1:** Pre-biopsy photo-documentation of the erythrosclaly ulcerated nodular papule lesion of concern, measured 6.5 cm x 5.5cm. Taken on September 30<sup>th</sup> 2020.



**Figure 2:** (a) Immunohistochemical analysis via CK-20 Staining at 400x magnification of a sample of the lesion shows characterization of neoplastic growth and Breslow thickness greater than 3.0mm. (b) Histopathological analysis of sample of the lesion via H&E staining at 20x magnification shows absence of peripheral palisading formations. (c) Histopathological analysis of sample of the lesion via H&E staining at 400x magnification shows aggregations of neoplastic cells with large round nuclei and granular cytoplasm. Mitosis and necrotic areas are present.



**Figure 3:** Photo-documentation of state of merkel cell carcinoma radiation site at different dates. Left: March 2021, Pre-amputation. Middle: April 2021, Pre-amputation. Right: June 2021, Post-amputation.

associated with long term morbidity to the knee joint. It is unclear whether the details of long-term joint morbidity from radiation were adequately understood by the patient. The radiation oncology note explains the risks of radiation included fatigue, skin breakdown, poor wound healing, joint stiffness, lymphedema, and scarring.

Radiation was administered to the left knee and groin between November 2020 and January 2021, with a dose of 2139 mGy-cm by the end of treatment (Sentinel lymph node biopsy of groin was negative). Post radiation, she developed a painful, chronically open wound, had major difficulty with pain control, and had 13 documented falls. Failed pain management included tramadol, medical marijuana, cyclobenzaprine, and oxycodone. By May 2021, she developed a 90-degree flexion contracture of the left knee along with the continued open wound. The wound became infected, requiring intense antibiotic therapy, and was debrided once. She was not a candidate for flap coverage due to significant vascular disease, smoking, diabetes. The patient was assessed for options to straighten the knee; it was explained that soft tissue releases would be insufficient to straighten the knee, and an external fixator would be necessary. Discussion conveyed that this is a very painful process with the possibility of cancer recurrence complicating treatment. Moreover, for her to keep the leg, the chronic wound would have to heal. With the goals of pain relief and improved mobilization, she agreed with an above the knee amputation which occurred in late May 2021 (Fig. 3).

## DISCUSSION

MCC has multiple mechanisms to escape destruction by the immune system such as inducing PD-1 expression, down regulation of both MHC class I and

MICA and MICB, down regulation tumor vascular E-selectin, and suppression of the antitumor cGas-STING pathway. MICA and MICB are proteins that stimulate natural killer cells, and E-selectin is necessary for cytotoxic T-cells to invade the tumor [1].

Therapy options include biologics, radiation, chemotherapy, and surgery.

The forefront MCC management includes PD-1/PD-L1 checkpoint inhibitors, CTLA-4 related therapy, adoptive T-cell therapy, neoadjuvant immunotherapy, and adjuvant immunotherapy. In Jurgen's 2024 comprehensive MCC overview, he describes the response rate of metastatic MCC to PD-1/PD-L1 inhibitors [1]. Specifically in his Table 2, he describes the objective response rate varied from 33% to 64% in 5 clinical trials, with a median patient age ranging from 66-74. Three of the five trials had been completed before 2020, so there was documented evidence in the therapeutic value of targeting this pathway at the time of the patient's diagnosis. Radiation therapy has associated risks regardless of the presence of an orthopedic prosthesis. Given the discussion of complications from radiation, we believe it would have been prudent to have pushed for immunotherapy prior to attempting radiation.

Due to diminished quality of soft tissue surrounding the joint due to radiation therapy, there is an increased risk for a periprosthetic joint infection in locations of treatment that are coincident with the radiation site [5]. It should be further evaluated the time necessary to minimize infection risk due to new arthroplasty in the treatment area of any dermatological procedure. These complications are especially important in patients with extensive medical history, such as smoking history and diabetes as shown in this case.

## CONCLUSIONS

While there is currently no clinical consensus, skin procedures should be avoided for at least 3 to 7 months after any colocalized arthroplasty [5,6]. In clinical practice, it is often recommended not to do any surgery in the vicinity of an upcoming knee arthroplasty. Risk of infection is always a concern – so much so that there are even guidelines that recommend not to shave 2 days prior to a knee replacement [5]. Even though the standard procedure maintains that no intraarticular injections are given prior to arthroplasty, this is extrapolated to avoid skin surgery prior to knee replacement [6,7].

When there is a potentially cancerous growth, it is our recommendation that it should be evaluated by a dermatologist. If the growth is uncertain or questionable, it should be biopsied prior to surgery, even if it means delaying the surgical procedure.

## Consent

The examination of the patient was conducted according to the principles of the Declaration of Helsinki.

The authors certify that they have obtained all appropriate patient consent forms, in which the patients gave their consent for images and other clinical information to be included in the journal. The patients understand that their names and initials will not be

published and due effort will be made to conceal their identity, but that anonymity cannot be guaranteed.

## REFERENCES

1. Becker JC, Stang A, Schrama D, Ugurel S. Merkel Cell Carcinoma: Integrating Epidemiology, Immunology, and Therapeutic Updates. *Am J Clin Dermatol.* 2024;25:541-57.
2. Coggshall K, Tello TL, North JP, Yu SS. Merkel cell carcinoma: An update and review: Pathogenesis, diagnosis, and staging. *J Am Acad Dermatol.* 2018;78:433-42.
3. Durst CR, Rezzadeh KI, Than JP, Rajaei SS, Spitzer AI. Intra-Articular corticosteroid injections into a preexisting total knee arthroplasty are associated with increased risk of periprosthetic joint infection and revision. *Arthroplast Today.* 2023;24:101237.
4. Gardner JM. *Survival Guide to Dermatopathology.* EA. Montgomery, Ed., Innovative Pathology Press, 2020. 47-52. ISBN:978-1-933477-49-7.
5. Zuidhof R-JWJ, Lowik CAM, Ploegmakers JJW, Dijkstra SPD, Wouthuyzen-Baker M, Jutte PC. Periprosthetic joint infection in orthopaedic surgical oncology. *Ann Joint.* 2019;4:26.
6. Yang X, Li L, Ren X, Niew L. Do preoperative intra-articular injections of corticosteroids or hyaluronic acid increase the risk of infection after total knee arthroplasty? A meta-analysis. *Bon Joint Res.* 2022;11:171-9.
7. Kim YM, Joo YB, Song JH. Preoperative intra-articular steroid injections within 3 months increase the risk of periprosthetic joint infection in total knee arthroplasty: a systematic review and meta-analysis. *J Orthop Surg Res.* 2023;18:148.

Copyright by Glenn Kolansky, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

**Source of Support:** This article has no funding source.

**Conflict of Interest:** The authors have no conflict of interest to declare.