



A Novel Non-Invasive Approach to Renal Angiomyolipoma: Evaluation of External Nano-Pad Therapy

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Abstract: Renal angiomyolipoma (AML) is a generally benign renal neoplasm composed of varying proportions of blood vessels, smooth muscle, and adipose tissue. Most renal angiomyolipomas are detected incidentally on imaging; however, larger or symptomatic lesions may present with flank or abdominal pain, hematuria, and, in severe cases, retroperitoneal hemorrhage. **Case Presentation:** We report the case of a 62-year-old woman who presented with left-sided renal and abdominal pain of approximately two months' duration. Imaging identified an angiomyolipoma measuring 28 × 24 × 21 mm in the upper-pole cortex of the left kidney. The manuscript describes treatment using an externally applied nano-coated pad positioned over the renal/ureteric region. According to the clinical observations reported by the authors, subsequent follow-up demonstrated disappearance of the previously identified lesion. **Intervention and Outcome:** The reported treatment involved application of a high-energy nano-coated pad externally over the region corresponding to the affected kidney and ureter. The authors report that substantial radiological changes were observed within approximately three weeks, including disappearance of the angiomyolipoma lesion. **Conclusion:** This case describes an unusual therapeutic approach to renal angiomyolipoma using an externally applied nano-coated pad. Although complete radiological disappearance of the lesion is reported, the findings should be considered preliminary and hypothesis-generating. Further prospective studies using standardized imaging, clearly defined treatment parameters, appropriate controls, and independent verification are required before the efficacy and safety of this intervention can be established.

Keywords: Renal angiomyolipoma; kidney tumor; nano-therapy; external therapy; case report; renal neoplasm.

1. Introduction

Renal angiomyolipoma (AML) is a benign renal tumor characterized by the variable presence of blood vessels, smooth-muscle components, and adipose tissue. The lesion is classified among perivascular epithelioid cell tumors and may occur sporadically or in association with tuberous sclerosis complex. Although many renal angiomyolipomas are discovered incidentally during ultrasonography, computed tomography (CT) or magnetic resonance imaging (MRI), symptomatic lesions may present with flank pain, abdominal discomfort and gross hematuria or in larger lesions, potentially life-threatening retroperitoneal hemorrhage. The presence of macroscopic fat within a renal lesion is an important radiological feature supporting the diagnosis of a classic angiomyolipoma.

The clinical management of renal angiomyolipoma depends on several factors, including tumor size, symptoms, growth pattern, anatomical location and risk of hemorrhage and the possibility of malignant transformation in selected subtypes.

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Established management approaches include active surveillance, selective arterial embolization, ablative techniques, partial nephrectomy and in selected circumstances, radical nephrectomy. The present report describes a 62-year-old woman with a left renal angiomyolipoma and documents the clinical observation following an externally applied nano-coated pad intervention. The purpose of this report is to describe the intervention and observed outcome and to provide a basis for further investigation.

Case Presentation

A 62-year-old female patient presented with left-sided kidney and abdominal pain that had persisted for approximately two months. Investigations identified a renal lesion consistent with angiomyolipoma. The lesion measured approximately $28 \times 24 \times 21$ mm and was located in the upper-pole cortex of the left kidney. The original manuscript describes the lesion as a fully formed angiomyolipoma and reports subsequent treatment with an externally applied Nono coated pad. The available manuscript does not provide sufficient detail regarding the patient's past medical history, laboratory investigations, renal function, previous treatment, detailed imaging characteristics, histopathological confirmation or relevant comorbidities. These details should be incorporated into a final journal submission where available.

Intervention

An externally applied nano-coated pad was positioned over the body surface corresponding to the affected renal and ureteric regions. According to the original manuscript, the intervention involved application of higher energy based on the presumed energy characteristics of the tissue. The manuscript reports that the treatment resulted in complete disappearance of the previously identified lesion and describes improvement in the kidney, pelvis, ureter and bladder findings. However the original report does not specify the physical characteristics of the nano-coated material, energy source, frequency, power density, duration of each treatment session, number of treatment sessions, distance between the device and the body or other parameters necessary to reproduce the intervention.

Follow-up and Outcome

The authors report that follow-up examination approximately three weeks after application of the nano-coated pad demonstrated marked improvement and disappearance of the previously identified angiomyolipoma. The manuscript describes the lesion as having completely disappeared following the intervention and reports associated improvement in the affected urinary tract structures. The original report does not provide the actual follow-up imaging images, measurements, radiological report, laboratory results or independent assessment confirming complete resolution. These objective data are essential for establishing the reliability of the reported outcome.

2. Discussion

Renal angiomyolipoma is generally considered a benign renal neoplasm (Figure.1). Its clinical significance is determined by factors including lesion size, symptoms, growth rate, vascular characteristics, and risk of hemorrhage. Imaging plays a central role in diagnosis and follow-up. Several established treatment approaches are available. Ablative therapy may use thermal energy or cryogenic techniques to destroy selected renal lesions. Selective arterial embolization reduces blood flow to an angiomyolipoma and may be used particularly when preservation of renal tissue is desirable or when there is a risk of hemorrhage. Partial nephrectomy removes the tumor while preserving the remaining functional renal tissue. Radical nephrectomy involves removal of the entire affected kidney and is generally reserved for selected clinical circumstances.



Figure 1.Before Treatment

The present case is notable because the authors report complete radiological disappearance of a $28 \times 24 \times 21$ mm renal angiomyolipoma following application of an externally applied nano-coated pad (Figure.2). The reported observation is potentially interesting because it describes a non-invasive therapeutic approach.



Figure 2. After Treatment

Nevertheless, a single case observation cannot establish treatment efficacy or demonstrate that the intervention caused the observed radiological change. Alternative explanations, including differences between baseline and follow-up imaging, measurement variability, imaging interpretation, spontaneous change or other unreported interventions, must be considered. Furthermore, the biological mechanism through which an externally applied nano-coated pad could cause complete resolution of renal angiomyolipoma has not been established in the present report. The proposed mechanism therefore requires experimental and clinical investigation before causal conclusions can be drawn.

3. Limitations

This report has several important limitations. First, it describes a single patient and therefore cannot establish general treatment efficacy. Second, detailed clinical, laboratory, imaging and treatment information is not provided in the original manuscript. Third, objective pre-treatment and post-treatment imaging data are not included in the available report. Fourth, the mechanism of action of the proposed nano-pad intervention is not established. Finally, the duration of follow-up appears limited, making it impossible to determine the long-term risk of recurrence or delayed adverse effects.

4. Conclusion

This case report describes a 62-year-old woman with a $28 \times 24 \times 21$ mm left renal angiomyolipoma and reports complete disappearance of the lesion following an externally applied nano-coated pad intervention. The observation is potentially hypothesis-generating and may justify further investigation of the proposed technology. However, the present evidence is insufficient to conclude that nano-pad therapy can eradicate renal angiomyolipoma. Rigorous prospective clinical studies with standardized imaging, reproducible treatment parameters, appropriate safety monitoring, independent outcome assessment and long-term follow-up are required to determine its efficacy and safety.

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