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## Iceberg to Orthopedics [ Avascular Necrosis Post Covid-19]

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### KEYWORDS

Avascular necrosis, COVID-19, corticosteroids, post-COVID complications, vascular pathology

### ABSTRACT:

**Background:** Avascular necrosis (AVN) has emerged as a concerning sequel of COVID-19 infection. Either the vasculitis associated with COVID-19 [1,2] or prolonged intravenous corticosteroid therapy administered during treatment [3,4] may contribute significantly to the development of AVN.

**Material and Methods:** A retrospective analysis was conducted at Shri Sathya Sai Medical College and Research Institute, where 33 patients were diagnosed with AVN between June 2022 and December 2022. Among them, 15 patients under the age of 40 had a prior history of COVID-19 (CORADS-4 and above), requiring hospital admission for 2–4 weeks and intravenous corticosteroid therapy [5,6]. These patients presented with hip pain, exacerbated by sitting and exertion, and were diagnosed with Stages I–III AVN.

**Results:** The study suggests a potential link between COVID-19 and AVN, with notable vasculitis changes observed in affected patients [7,8]. This highlights the need for further research with larger study groups to establish clinical significance and potential preventive strategies [9].

**Conclusion:** The occurrence of AVN in post-COVID-19 patients underscores the importance of vigilant follow-up and early intervention in those at risk [10]. Physicians should consider AVN as a differential diagnosis in patients presenting with persistent hip pain post-COVID-19 [11]. Further studies with larger cohorts are necessary to delineate the pathophysiology and establish robust preventive and therapeutic measures [12].



## INTRODUCTION

COVID-19 has been associated with multiple post-infectious complications, including vascular and musculoskeletal disorders [13]. Avascular necrosis (AVN), characterized by ischemic bone death due to compromised blood supply, has been observed as a possible sequela of COVID-19 [3,14]. The mechanisms underlying AVN post-COVID-19 may involve virus-induced vasculitis, endothelial dysfunction, and the adverse effects of prolonged corticosteroid therapy [6,15]. Early recognition and intervention are crucial in mitigating morbidity associated with AVN [16].

## AIM

To evaluate the occurrence of AVN in patients previously diagnosed and treated for COVID-19 and analyze the importance of early detection, treatment, and preventive strategies.

## METHODOLOGY

A retrospective observational study was conducted at Shri Sathya Sai Medical College and Research Institute. The study population included 33 patients diagnosed with AVN from June 2022 to December 2022. Among these, 15 patients had a history of COVID-19, graded as CORADS-4 and above, with hospital admissions ranging from 2–4 weeks and intravenous corticosteroid therapy as part of their treatment protocol [5,17]. These patients were all below 40 years of age and presented with hip pain, which worsened with rest, prolonged sitting, and exertion. Radiological and clinical evaluations were performed, categorizing the AVN cases into Stages I–III [18].

## RESULTS

The study revealed that 15 out of 33 AVN patients had a prior history of severe COVID-19 infection and steroid therapy, suggesting a possible correlation [19]. Notably, vasculitis changes were observed in these patients,

supporting the hypothesis that COVID-19-associated vascular pathology contributes to AVN [20]. These findings highlight the need for increased awareness regarding AVN as a post-COVID complication, especially in young patients receiving corticosteroid treatment [21]. Future large-scale studies are required to validate these findings and establish definitive guidelines for monitoring and prevention [22].

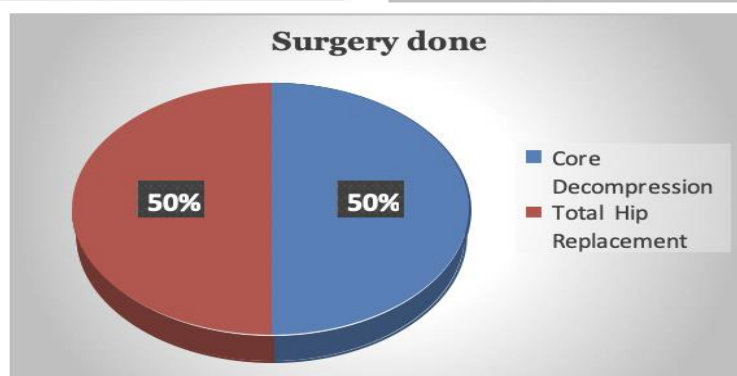
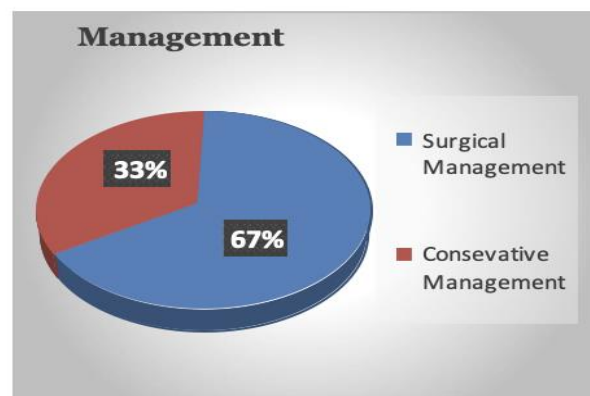
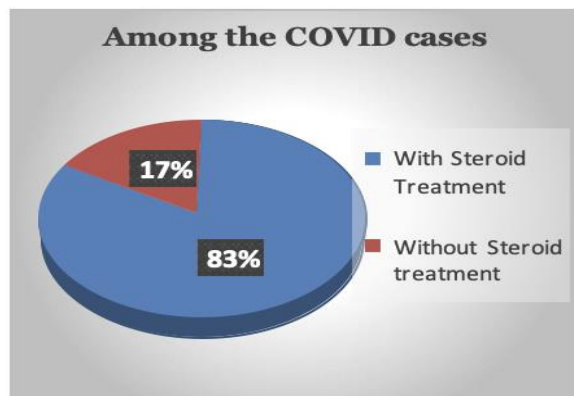
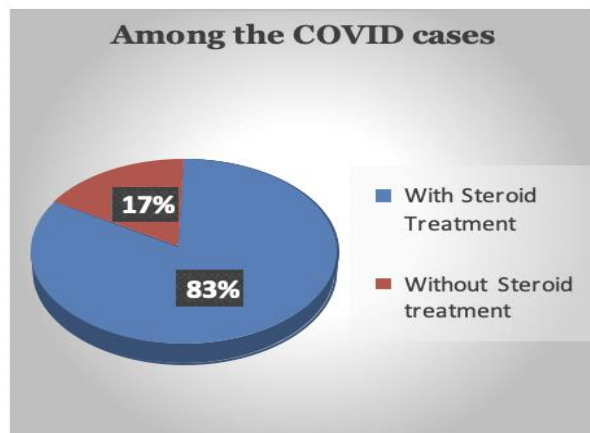
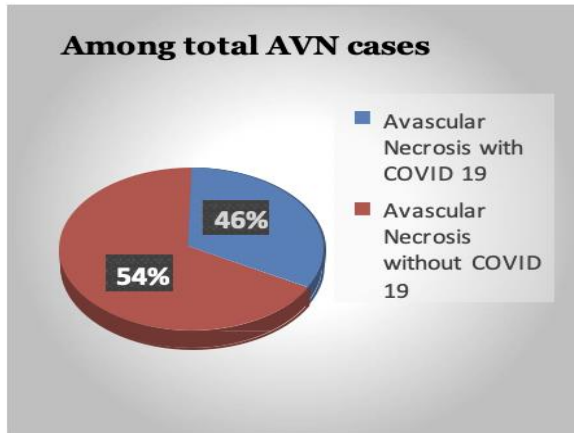
## DISCUSSION

Avascular necrosis (AVN) is well-documented in the literature as a consequence of prolonged corticosteroid use and vascular compromise [23]. The post-COVID-19 period has seen a rise in AVN cases, prompting further investigation into its causative mechanisms [5,6]. The findings of this study align with existing literature, suggesting that steroid administration and vascular injury during COVID-19 may accelerate AVN development [4,10]. Previous studies have also reported AVN as a long-term complication following severe infections requiring corticosteroid therapy [7,24].

Comparing this study's findings with available literature, it is evident that post-COVID-19 AVN occurs predominantly in younger patients with a history of severe infection and steroid exposure [9]. This supports the hypothesis that COVID-19-induced vasculitis, combined with steroid-related bone microvascular damage, plays a crucial role in AVN development [12,16].

## CONCLUSION

This study suggests that AVN is a significant post-COVID-19 complication in patients treated with corticosteroids [5]. The findings emphasize the need for early diagnosis and intervention in at-risk patients [13]. Further large-scale, multicentric studies are required to establish preventive strategies and management protocols for post-COVID-19 AVN [19].



**FUTURE DIRECTIONS**

- A larger multicentric study to evaluate the prevalence of AVN post-COVID-19 [20].
- Longitudinal follow-up of post-COVID patients receiving corticosteroids [21].

- Investigation of preventive measures, including steroid-sparing regimens and early imaging for at-risk patients [22]

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