Case Report

Sahel Journal of Veterinary Sciences

Sahel J. Vet. Sci. Vol. 22, No. 4, Pp 33-35 (2025)
https://doi.org/10.54058/q8bz5k74

Article History
Received: 20-10-2025
Revised: 15-12-2025
Accepted: 15-12-2025
Published: 13-01-2026

A Case Report of Bovine Tuberculosis at Ubakala Slaughterhouse, Abia State, Nigeria

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ABSTRACT

Bovine tuberculosis poses a significant threat to public health as humans become infected via consumption of meat or milk of infected animals. The report of a case of bovine tuberculosis during routine meat inspection at the Ubakala Slaughterhouse in Abia State, aims at providing insights into disease surveillance and control measures. Routine postmortem inspection of slaughtered cattle involving observation, palpation and incision of organs and examination of the carcass were carried out. Findings in this case report were based on gross examination and post-mortem lesions observed from the affected carcass. Postmortem examination revealed presence of tuberculous lesions and caseous nodules in lungs of the slaughtered cow. Incision into the lobes of the lungs gave a gritty sound revealing more caseous nodules. While the gross lesions observed provide valuable preliminary evidence suggestive of bovine tuberculosis, the absence of laboratory confirmation limits definitive diagnosis. Strengthening bovine tuberculosis control programs remains essential for safeguarding public health, improving livestock productivity, and ensuring the safety of the meat supply chain.

Keywords: Bovine tuberculosis; Post-mortem inspection; Slaughterhouse; Zoonotic

INTRODUCTION

Bovine tuberculosis (bTB) is a disease of cattle caused by the bacterium, *Mycobacterium bovis* belonging to the *Mycobacterium tuberculosis* complex (Cadmus *et al*., 2011). *Mycobacterium tuberculosis* which causes tuberculosis in humans and other members of the *M. tuberculosis* complex have also been isolated from cattle linked to bTB (Bikom *et al*., 2021). Bovine tuberculosis is transmitted to humans via the consumption of unpasteurized milk or through inhalation of infectious droplets as well as ingestion of infected meat which can result in human tuberculosis cases (Jenkins *et al*., 2011; Agbalaya *et al*., 2020).

In Nigeria, the majority of cases of bTB are found mostly during meat inspection after slaughter and previous studies have reported varying prevalence in various parts of the country (Agbalaya *et al*., 2020). The clinical signs of bTB may vary depending on the site of localization, infectious dose, virulence, immune status of the animal, external factors such as husbandry practices, environmental stressors, and animal movement (Pollock and Neill, 2002). A major obstacle to the postmortem diagnosis of bTB in abattoirs across Nigeria is the widespread refusal of butchers to cooperate with meat inspectors. They perceive condemnation as a large financial loss and are likely to conceal bTB-infected carcasses to prevent them from being confiscated (Cadmus, 2019). The prevalence of zoonotic bTB in Nigeria has been exacerbated due to breakdown in public health services and infrastructures, poor sanitation, high level of illiteracy including risky cultural practices that include eating of raw meat and drinking of unpasteurized milk which may be contaminated with *M. bovis* (Cadmus, 2019; Odetokun *et al*., 2022).

This work was carried out to provide information on occurrence and surveillance of bTB aimed at highlighting and providing adequate knowledge on the current status of animal disease at the Ubakala slaughterhouse. The high prevalence of bTB across slaughterhouses with a lack of comprehensive effective control and eradication measures in Nigeria re-emphasizes the role of slaughterhouses in providing valuable information on animal disease surveillance (Cadmus, 2019).

Case History

The Ubakala slaughterhouse was visited by veterinarians and clinical students from the Department of Veterinary Public Health and Preventive Medicine, Michael Okpara University of Agriculture, Umudike. This visit was

carried out as part of the research program and teaching of meat inspection procedures. Animals slaughtered were mostly cattle of varying breeds purchased from different parts of the country for sale. The cattle were brought straight to the slaughter hall by the workers with no rounds of ante-mortem inspection carried out on each cow.

Gross/Post-mortem Inspection Findings

The bovine carcass was examined after slaughtering according to the standard procedures set by OIE (World Organization for Animal Health, 2016). The structures on the head including the jaw muscles, tongue, lymph nodes, mucus membranes were examined for abnormalities. The carcass halves were inspected for signs of swellings. An incision was made into the biceps, triceps, muscles of the shoulder and back to observe for cyst. The surface and lobes of the lung, heart, liver, spleen, and kidneys were carefully inspected for lesions by general observation and palpation. An incision was made into the heart, lungs and liver using a sharp knife to check for pus, abscesses and other abnormalities. The lesions were identified using the standard methodology used for post-mortem examination of cattle in the slaughterhouse.

Visual observation of the lungs showed foci of caseous nodules on the dorsal aspect of the lungs affecting about one-third of the lobe (Figure 1A). Postmortem inspection revealed extensive tuberculous lesions on the four lobes of the lung, as shown in figures 1B-1D. Nodules of varying sizes were scattered all over the lobe of the lung (Figure 1B). There was presence of firm nodules on the trachea revealed on palpation. Incision into the lobe of the tuberculous lung showed an extensive area of caseous nodules distributed throughout the parenchyma (Figure 1C). The caseous nodules gave a gritty sound, characteristic of tuberculous lesion which is preliminary and presumptive of bTB (Figure 1D). The level of spread of the tubercle lesions was spread throughout the entire lung, with an extensive tissue damage.

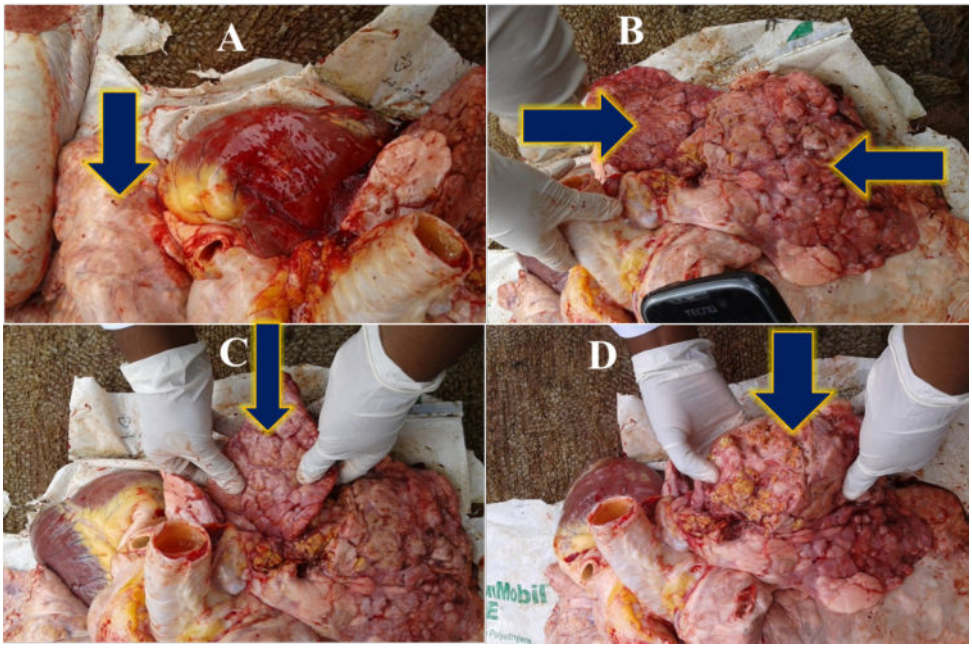

Figure 1: Multiple encapsulated foci of firm, caseous nodules distributed across the dorsal portion of the lung (**A**), Several small-to medium-sized nodules scattered over the lung surface. Palpation of the trachea indicated the presence of a few firm nodules along its length (**B**), The lung lobe shows numerous coalescing nodules with areas of caseous necrosis, occupying about half of the affected lobe (**C**), Incised lung lobe revealing multiple caseous nodules of varying sizes, moderately distributed throughout the parenchyma (**D**).

DISCUSSION

The gross pathological findings described in the current case of bTB were ranging from multiple encapsulated, mineralized foci to extensive, nodular, caseous tissue. The lesions in the lungs were extensive, caseous and contained gritty nodules which are consistent with infection with *Mycobacteria*. In the present case report, tuberculous lesions were mainly localized in the lungs, which could be suggestive of the aerosol mode of transmission of the infection. Evidence indicates that the transmission pathway of *M. bovis* can be determined from the distribution of lesions in an infected animal (Mekonnen *et al*., 2020).

The findings from the current case are similar to the findings of Tukur *et al*. (2022) which reported the highest occurrence of suspected lesions of bTB in the lungs of cattle amongst other affected tissues. The postmortem findings were consistent with Cadmus *et al*. (2004) who also reported encapsulated foci and caseous nodules in the dorsal region of the bovine lung.

Reports and knowledge of occurrence of bTB given its zoonotic and public health importance is vital for informed policies and measures that will effectively reduce the spread of this disease (Agbalaya *et al*., 2020). This case report is a wake-up call for the need to strengthen meat inspection and active surveillance in the Ubakala slaughterhouse, increase public awareness on bTB and the public health impact of consuming infected meat and meat products.

Confirmatory evidence of bovine tuberculosis (bTB) could not be established as tissue samples were unavailable for laboratory culture. The absence of samples limited the ability to further carry out a diagnosis to identify the specific organism and also rule out other organisms that may give similar microscopic result like the acid-fast bacilli. This limitation highlights a logistical constraint in sample acquisition within abattoir settings, reflecting the need for improved collaboration and awareness among meat handlers to enhance diagnostic surveillance and disease monitoring at the Ubakala slaughterhouse.

Conclusion

This case highlights the public health threat of bovine tuberculosis at Ubakala slaughterhouse due to weak regulatory measures. The Abia State government should collaborate with key stakeholders within the animal sector and veterinary institutions in adopting modalities to strengthen meat inspection procedures and enhance food safety. Training programs and compensation plans for butchers with condemned carcasses should be implemented. Further research on the knowledge, attitudes, and risk factors among abattoir workers and consumers in Abia State is needed to support bTB control.

Acknowledgment

We acknowledge staff and management of Department of Veterinary Services, butchers and all other staff of Ubakala slaughterhouse, Abia State.

Conflict of Interest

The authors declare that they have no conflict of interest.

Authors' Contribution

The study was conceptualized by AU. AU wrote the introductory and result sections. EIG wrote the discussion and reviewed the whole manuscript to adhere to the journal's guideline. Both authors read and approved the final manuscript before submission.

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