ULTRASOUND GUIDED PERCUTANEOUS ASPIRATION OF UDDER ABSCESS IN DAIRY COWS WITH CHRONIC MASTITIS

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ABSTRACT

A retrospective study was carried out to assess the udder affections of cows that were presented to the Large Animal Medicine Referral Clinic of Veterinary College and Research Institute, Thanjavur, Orathanadu, Tamil Nadu during June 2017 to April 2018. In this study involving 161 cows, 4 cows were found to have udder swelling / abscess diagnosed by ultrasound and percutaneous aspiration done under sonagraphic guidance. Udder ultrasound revealed hyperechoic alveolar tissue with anechoic/ heterogenous content in the affected quarters. Aspirated samples were culturally positive for the isolate Staphylococcus aureus and E. coli. In vitro antibiotic sensitivity test showed highest susceptibility to Streptomycin followed by Enrofloxacin and Ciprofloxacin, Gentamicin and Amoxicillin with good recovery on treatment.

Key Words: Cow, Mastitis, Udder abscess, Ultrasonography

INTRODUCTION

Many times, diagnosis of udder abscess is missed under field conditions, as such cases demonstrate signs of chronic mastitis. Without the use of ultrasonography diagnosing smaller abscess in udder is difficult. This study documents the use of ultrasonography for the evaluation of udder and related pathological changes in cows with chronic mastitis. When there are less / no clinical signs of mastitis, ultrasonographic evaluation of udder may prove fruitful in better diagnosis and management.

MATERIALS AND METHODS

This study comprised a total of 161 cows which were presented with mastitis to the Mastitis Clinic and Udder Health Laboratory of Large Animal Medicine Referral Clinic, Veterinary College and Research Institute, Orathanadu, Thanjavur, Tamil Nadu during June 2017 to April 2018. Cows evaluated with udder ultrasound and

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found to have udder abscess were used for this study. Four such cows were identified and medical records analyzed. The affected cows had the history of fluctuating hard swollen udder. Such cows had cessation of milk or yellowish secretions from affected quarters. There was no history of any trauma to udder or teat in these animals. Physical examination of udder showed fluctuating smaller masses, which were hard in consistency.

Teats were either normal or engorged in affected quarters. Intermittent mastitic episodes were reported by the owners. Systemic examinations were unremarkable. Ultrasonographic examination was performed in standing posture without sedation. "Esoate Mylab-40" Ultrasound Station was deployed with a 2.5 to 5MHz curvy linear probe. As per standard protocols (Cartee *et al*., 1986; Selvaraj *et al*., 2016), udder was evaluated with gel contact techniques. Ultrasound guided aspiration was done from the affected quarters and samples were collected in sterile culture tube. Udder abscess aspirate and milk samples from other quarters were subjected to laboratory assessment for mastitis and antibiogram studies. California Mastitis Test was used to confirm mastitis.

The aspirate from udder abscess were inoculated into the nutrient broth and incubated at 37°C for 24 hrs, then broth culture was inoculated into the Mannitol salt agar and Manconkey agar, respectively and incubated at 37°C for 12-24 hrs. The golden yellow and pink colour colony were observed in Mannitol salt agar and Manconkey agar, respectively and confirmed the presence of *Staphylococcus aureus* and *E.coli* in the respective culture medium.

RESULTS AND DISCUSSION

Udder abscesses are clinically manifested either in a form of chronic suppurative mastitis caused by common environmental pathogens (Contreras *et al.,* 2003) or in a circumscribed localized swelling anywhere in the udder and most commonly seated on craniolateral and posterior aspects of the udder quarters (Misk, 2008). Among 161 cows, 73 cows had clinical mastitis, 27 had subclinical mastitis, 23 cows had udder edema, 20 cows had haemogalactia 13 cows had fibroses and 4 cows had udder abscess. Clinical mastitis occurred in higher percentage during this period. Among the presented chronic mastitis cases, four cows were found to have udder abscess (Fig. 1). Ultrasound was deployed for diagnosis of udder abscess in a cow for differential diagnosis (Selvaraj *et al.,* 2006). Abd-El-Hady (2015) reported that udder abscesses were encountered in 5.83% of lactating cows. In this study it was lesser (3.1%). Local signs of abscess of considerable sizes will be obvious and the diagnosis can easily be made and confirmed by aspiration (Tyagi and Singh, 2001). In the present study only one cow with affected quarter had obvious clinical sign of abscess and in other cows, it could not be diagnosed with physical examination alone.

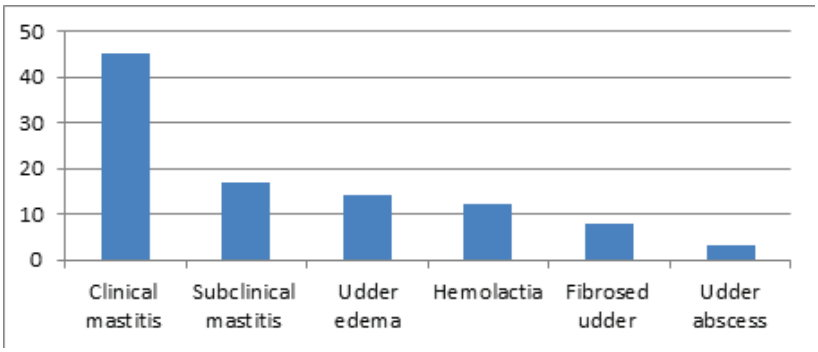


Fig. 1. Percent of cases of udder affections during 2017-18

Ultrasonographic examination of udder revealed hyperechoic alveolar tissue with anechoic / heterogenous content in the affected quarters. This helped to confirm that an abscess or haematoma present in the udder tissue. Ultrasonographic assessment of udder not only helped in diagnosis but also helped in aspiration. Ultrasound guided aspirations were done and the physical examination of aspirated head of all the swollen quarters showed varying patterns of secretions viz., serosanguneous, watery to thick yellowish pus (Fig. 2).

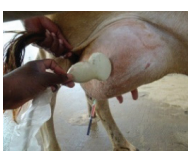
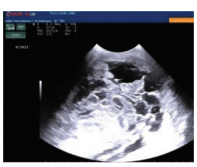
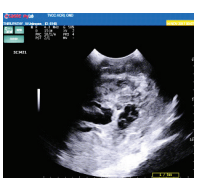
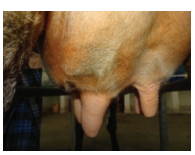
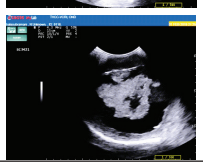
S. No.	Physical examination of affected quarter and milk secretion		Ultrasonographic findings		Physical character of aspirate / milk	Isolates identified
Cow 1	Left fore – Enlarged, whitish watery		Heterogenous echoic content in anechoic cavity		Thick yellowish pus	*Staphylococcus aureus*
Cow 2	Right hind – slightly enlarged, whitish watery		Hyperechoic alveoli floating in echoic cavity		Serosanguneous watery	*E. coli*
Cow 3	Right fore – enlarged, whitish watery		Hyperechoic alveoli with packets of echoic cavities		Serosanguneous watery	*E. coli*
Cow 4	Left hind –hard swelling, no milk secretion		Heterogenous content in anechoic cavity		Thick yellowish pus	*Staphylococcus aureus*

Fig. 2. Physical, ultrasonographical and microbial description of udder abscess

Ultrasonography of udder was reported to be a helpful tool in diagnosing pathological alterations of udder such as inflammation, mucosal lesions, tissue proliferation, foreign bodies, milk stones, congenital changes, hematoma and abscess (Szencziová and Strapák, 2012). Flock and Winter (2006) and Franz *et al.* (2009) reported that tumours, foreign bodies, connective tissue build-ups, edema of the udder without mastitis symptoms are some of the clinical conditions which cannot be detected by clinical examination and that such cases were later detected using ultrasonographic studies of udder parenchyma. The same was observed in this study too. Diagnosis of udder abscess depends on exploratory aspiration which can reveal the presence of pus and necrotic tissues (Abd-El-Hady, 2015). In the present study, non-invasive method of diagnosis using ultrasonography was undertaken on swollen udder of cow no. 1 and 4 and it revealed of anechoic cavity with heterogenous contents. In cow no.2 and 3, it showed hyperechoic alveolar tissue with smaller pockets of anechoic cavities which were the udder abscess (Fig. 2).

Rather than blindly puncturing udder with a needle and injuring udder tissue and possibly introducing infections, udder ultrasound helps in exact localization of the affections and aspiration of affected areas alone. This helps in minimizing tissue injury encountered with blind aspiration techniques. Ultrasound guided aspiration was done and the aspirates from affected quarters were processed for bacteriological culture. They were culturally positive for the isolate *Staphylococcus aureus* and *E.coli* (Fig. 2). These isolates were subjected to *invitro* antibiotic sensitivity test and it showed highest susceptibility to Streptomycin followed by Enrofloxacin and Ciprofloxacin, Gentamicin and Amoxicillin. After standard therapeutic measures were instituted these cows made uneventful recovery.

CONCLUSION

From this study, it could be concluded that physical examination of udder alone cannot help in detecting hidden affection like udder abscess. In such cases ultrasonography allows perspective imaging of udder parenchyma. Cows with chronic mastitis could be effectively evaluated using ultrasonography to rule out udder abscess.

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