

Research Summaries II

Milk flow obstruction caused by varicose veins in the teats in dairy cattle: 22 cases

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Introduction

A varicose vein is the permanent dilatation of a vein; it can have a primary (valvular insufficiency) or secondary cause (venous hypertension). In dairy cows, the udder is filled with long and sinuous veins that have a great risk of becoming varicose. Furthermore, dilated and prominent mammary blood vessels are a genetic attribute researched among breeders. However, when an enlarged vein is located at the annular ring or within the teat wall, it may partially or totally obstruct normal milk flow. The objectives of this study were to describe this condition in dairy cattle and the surgical procedures used to restore milk flow, and to determine the prognosis for affected cows following surgery. Our hypothesis was that prognosis depends on the surgical procedure performed.

Materials and Methods

A medical record search was performed. Selection criterion was a dairy cow with milking difficulties caused by a varicose vein; if another lesion was found as a potential cause of the milk flow obstruction, the cow was excluded from the study.

Signalment and physical exam findings were obtained from the medical record. The ability to machine-milk or hand-milk the quarter was recorded. Diagnostic imaging results, including ultrasound evaluation, venography, and thelography were reviewed. Ultrasound evaluations were performed with a 7.5 MHz transrectal probe, and longitudinal and transverse images of the teat were obtained. The venography was obtained after the infusion of iodinated contrast product through a small gauge catheter secured in the varicose vein. The thelography was obtained by infusion of iodinated contrast product within the teat cistern through a small gauge cannula inserted through the streak canal.

Surgical treatments used were sclerotherapy, ligation of the vein, and phlebectomy. The sclerotherapy consisted of the infusion of 5 to 10 mL of a 25% dextrose solution in the vein under tourniquet, which was kept in place for 15 minutes after the dextrose injection. The ligation of the varicose vein consisted of the isolation of the vein's blood supply by the application of a double ligation on it. The phlebectomy consisted of removing the varicose vein en bloc.

Complications following the surgery were retrieved from the medical record. The long term prognosis was obtained through a telephone interview that was performed at least six months after the cow was discharged from the hospital.

Descriptive statistics were performed. The association between surgical technique and long-term prognosis was assessed with a chi-squared analysis; values of $P < 0.05$ were considered significant.

Results

Between 1998 and 2011, a total of 22 Holstein cows with a mean age of 4.7 years met the inclusion criterion. Two cows had two teats with a varicose vein and one cow was examined three times with the same problem on the same teat; thus, there were 26 presentations for 24 teats. Two cows were in their first lactation, 15 were in their second or third lactations, and seven were in their fourth lactation. Half the cows were examined during the first 60 days after calving. For 14 cows, the condition had evolved over several weeks, and 10 of those cows had problems during the previous lactation. The forequarters ($n = 18$) were more frequently affected than hindquarters (24; $P < 0.01$).

Ultrasonography was performed on all cases to allow visualization of the obstruction and elimination of other causes of milk flow obstruction. Angiography was performed on 15 teats and aided in the detection of

collateral vessels to the varicose vein. Thelography was performed on seven teats and provided similar information as that obtained with ultrasonography.

Three veins were infused with the sclerotic agent, 12 were ligated, six were phlebectomized, and five were not surgically treated. Improved milk flow was obtained for 2 of 3, 8 of 10, and 6 of 6 teats, in which the varicose vein was treated with sclerosis, ligature, and phlebectomy, respectively. The overall success rate (ie, prognosis) after surgery was 84%, and the prognosis did not differ significantly among the three surgical techniques.

Significance

Cows can have milk flow obstructions caused by varicose veins in any lactation. The obstruction usually worsens over several weeks. Ultrasonography is an ideal method to evaluate the obstruction, and usually reveals a large vessel compressing the teat cistern.

The three types of surgery (sclerotherapy, ligature, and phlebectomy) used to eliminate the varicose veins in this study did not impact the prognosis (ie, re-establishment of milk flow). However, because of the low number of cows treated with sclerotherapy and phlebectomy, it is difficult to draw any conclusions.

For cows treated with sclerotherapy or ligature, failure was caused by recurrence of the varicose vein, most likely because of revascularization of the vein through a collateral vessel. Venography is important to identify those collateral vessels. If there are numerous collateral vessels feeding the varicose vein, phlebectomy might be a better surgical option. Phlebectomy is a difficult procedure to perform, because it is challenging to isolate the varicose vein without perforating it or invading the milk cistern. Phlebectomy seems to cause more swelling during the post-operative period, which can lead to fibrosis of the teat wall.