IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS)
e-ISSN: 2319-2380, p-ISSN: 2319-2372. Volume 19, Issue 8 Ser. 1 (August. 2026), PP 60-63
www.Iosrjournals.org

Surgical Amputation of a Notomelic Limb in a Korean Native Calf: A Case Report

Junggyu Shin[1], Seungho Choi[1], Hoon Kim[1], Suyoung Heo[1], Namsoo Kim[1,*]
[1]*College Of Veterinary Medicine, Jeonbuk National University, Iksan 54596, Republic Of Korea*

Abstract:
Background*: Notomelia, a dorsal manifestation of polymelia, is a rare congenital anomaly in cattle and has been only infrequently reported in male calves. Surgical correction is indicated for animal welfare and preventing mechanical complications, though vertebral–scapular fusion can pose risks during resection in field conditions where advanced cross-sectional imaging is unavailable.*
Case Presentation*: A 24-day-old, 37-kg male Korean native calf presented with a right-sided, non-functional supernumerary limb originating from the dorsal thoracic region. Lateral radiography identified an accessory scapula adjacent to the thoracic vertebrae. Under general anesthesia, distal scapular amputation including the acromion was performed using an oscillating saw after intraoperative visual inspection and manual palpation confirmed vertebral–scapular fusion. Bone marrow was sealed with bone wax, and a muscle flap was mobilized to cover the osteotomy site.*
Outcome*: The calf recovered rapidly, standing unassisted within 3 hours, and was discharged the same day. At the 18-day follow-up, ambulation was normal, the surgical wound had healed completely without dehiscence or infection, and skin staples were uneventfully removed.*
Conclusion: *Distal scapular amputation guided by radiographic evaluation and careful intraoperative anatomical assessment provides a practical, safe, and effective surgical approach for managing notomelia in calves when advanced imaging modalities are inaccessible.*
Key Word*: Notomelia; Polymelia; Supernumerary limb; Distal scapular amputation; Korean native calf.*

Date of Submission: 21-08-2026 Date of Acceptance: 02-09-2026

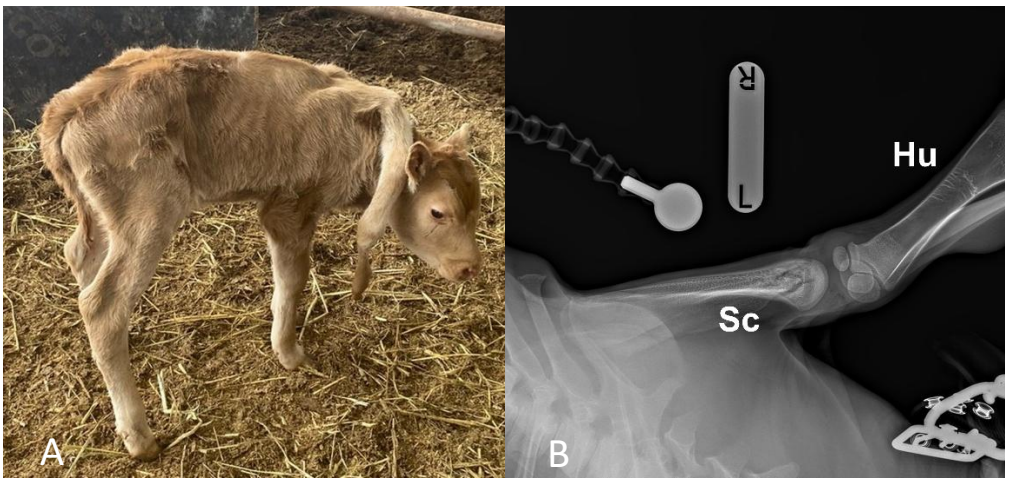
I. Introduction

Congenital anomalies in cattle have been widely documented[1-3]. Among these anomalies, polymelia refers to the presence of one or more supernumerary limbs, classified according to the site of attachment as thoracomelia, cephalomelia, pygomelia, or notomelia when the limb arises from the dorsal thoracic or lumbar region[4,5]. The etiology of polymelia is not fully understood. Proposed mechanisms include incomplete separation of monozygotic twins, aberrant migration of limb bud cells, or teratogenic disruptions during embryogenesis. Chromosomal chimerism has also been reported in affected calves, suggesting a genetic predisposition[5,6]. Clinically, notomelia is rare, and most reported cases occur in female calves. Its occurrence in males is therefore notable[4,7]. Affected animals may present with cosmetic deformities, impaired locomotion, or pressure sores from abnormal posture[8,9]. Surgical removal of the supernumerary limb is typically indicated for welfare and to prevent complications. However, vertebral–scapular fusion can complicate surgical planning, as scapulectomy may risk vertebrospinal injury[4]. While advanced imaging such as computed tomography (CT) or magnetic resonance imaging (MRI) provides valuable anatomical detail, its use is often limited in farm animal practice due to cost and logistics[5]. This report describes the clinical presentation, surgical management, and outcome of a male Korean native calf with notomelia, emphasizing intraoperative decision making without advanced imaging.

II. Case Presentation

A 24-day-old, 37 kg male Korean native calf was presented with a right-sided, non-functional supernumerary limb originating from the dorsal thoracic region (Figure 1A). The calf showed normal posture and gait, and no other congenital anomalies were identified. Lateral thoracic radiography revealed an accessory scapula adjacent to the spinous processes of the thoracic vertebrae (Figure 1B).

Figure 1 : Preoperative clinical and radiographic findings in a calf with notomelia. (A) Preoperative appearance of the calf showing an accessory thoracic limb consistent with notomelia. (B) Preoperative radiograph demonstrating the anatomical relationship between the scapula (Sc) and humerus (Hu), raising suspicion of scapular involvement without definitive evidence of vertebral–scapular fusion. (Hu — Humerus; Sc — Scapula).



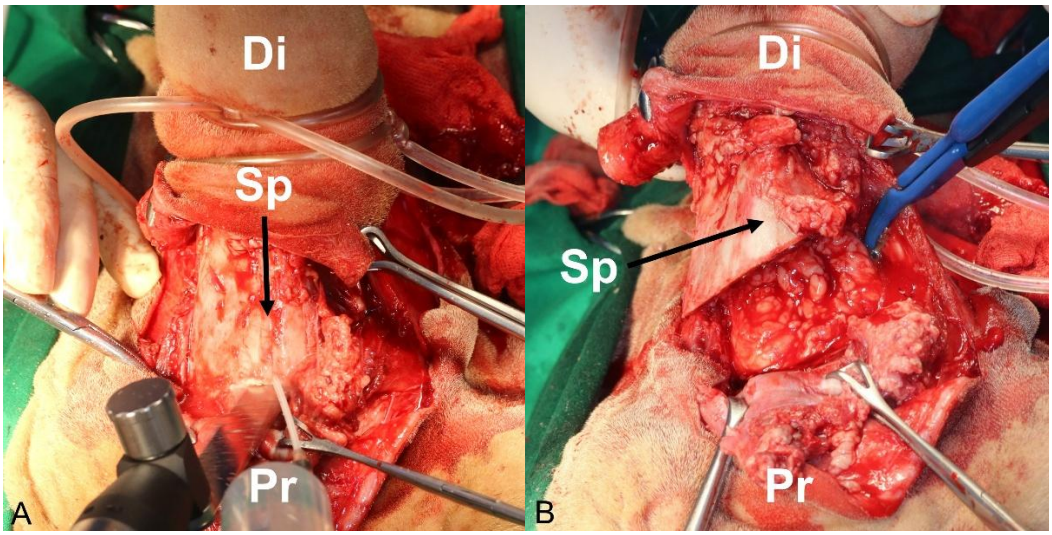
Anesthesia and surgical procedure

Prophylactic ampicillin (20 mg/kg, intramuscular) was administered 30 minutes prior to surgery. Premedication included xylazine (0.1 mg/kg, intramuscular) and butorphanol (0.02 mg/kg, intravenous). General anesthesia was induced with ketamine (4 mg/kg, intravenous) and maintained with sevoflurane in oxygen under pressure-controlled ventilation. Physiological parameters including heart rate, respiratory rate, oxygen saturation, and end-tidal carbon dioxide concentration were monitored throughout.

The calf was positioned in sternal recumbency, and the surgical field was prepared aseptically. A semicircular skin incision was made over the accessory scapula. Blunt and sharp dissection exposed the scapula. Minor bleeding was controlled with electrocautery, and major vessels were double ligated with 3-0 polydioxanone.

Intraoperative visualization and palpation confirmed vertebral–scapular fusion, making complete scapulectomy unsafe. Distal scapular transection including the acromion was performed using a colibri oscillating saw (DePuy Synthes, Raynham, Massachusetts, USA) (Figure 2). Bone marrow was sealed with bone wax, and sharp edges were smoothed. A muscle flap was mobilized to cover the osteotomy site, and the skin was closed with staples.

Figure 2 : Intraoperative findings during distal scapular amputation. (A) Intraoperative exposure of the distal scapular region, where careful visual inspection and manual anatomical assessment were performed to evaluate bone continuity and determine a safe level for transection. (B) Intraoperative appearance following completion of distal scapular amputation. (Di — Distal; Pr — Proximal; Sp — Scapular spine).



Postoperative care and follow-up

The calf stood unassisted within 3 hours and resumed feeding. The patient was discharged the same day. Ampicillin (20 mg/kg, intramuscular) was continued for 7 days. Wound dressing with 1% povidone-iodine was performed on day 3 and every 5 days thereafter.

At the 18-day follow-up, the calf exhibited normal ambulation (Figure 3A). The surgical site healed without dehiscence or infection, and staples were removed (Figure 3B). A residual scapular prominence was palpable but clinically insignificant.

Figure 3 : Postoperative outcome following distal scapular amputation. (A) Postoperative clinical appearance of the calf after surgery. (B) Close-up view of the surgical site demonstrating satisfactory wound closure during the early postoperative period.

III. Discussion

Documented cases of notomelia and polymelia in livestock illustrate considerable diversity. Muirhead et al.[4] described a Holstein calf with a cervical supernumerary limb, while Morath-Huss et al.[5] reported a Simmental calf with polymelia evaluated using CT. Kim et al.[7] presented a Korean native calf with two additional forelimbs at the scapular region, which resembles the present case anatomically. Pourlis et al.[8] described a piglet with notomelia, and Munif et al.[9] reported a calf with perineal polymelia. Epidemiological surveys also indicate that congenital anomalies remain a relevant concern in cattle populations[1,2]. Collectively, these studies highlight the variability of notomelia in terms of species, sex, and anatomical site.

CT and MRI provide detailed visualization of vertebral–scapular fusion and surrounding structures, thereby facilitating surgical planning[5]. In particular, CT has proven effective in confirming the extent of fusion and identifying surgical landmarks. However, these modalities are rarely feasible in cattle practice due to cost and availability. In the present case, radiographic findings, together with careful intraoperative visual inspection and manual assessment of the anatomical structures, provided sufficient information to support safe surgical decision-making in the absence of advanced cross-sectional imaging.

Several surgical options for managing notomelia have been reported, including complete scapulectomy and shoulder disarticulation[10]. When vertebral–scapular fusion is present, distal scapular transection provides a safer alternative. The application of a muscle flap was an important factor contributing to successful healing[11]. Muscle flaps enhance vascular supply, reduce tension, and improve mechanical coverage, thereby minimizing complications[12]. The calf in this report recovered rapidly, standing within hours, and demonstrated uneventful healing by 18 days.

The present case is limited by its single-case design and the absence of CT or MRI confirmation of vertebral–scapular fusion. Additionally, follow-up was short-term, focusing on immediate recovery rather than long-term outcomes.

Advances in three-dimensional imaging, custom surgical planning, and wider availability of CT or MRI could improve management of congenital anomalies such as notomelia in livestock. From a welfare perspective, timely surgical correction improves quality of life, reinforcing the importance of recognizing and treating such conditions in cattle practice.

IV. Conclusion

Distal scapular amputation based on plain radiographic findings and meticulous intraoperative visual and manual assessment provides an effective and safe surgical approach for managing notomelia in calves when advanced cross-sectional imaging is unavailable.

References

[1]. Mee JF, Murphy D, Curran M. Bovine congenital defects recorded by veterinary practitioners. Reprod Domest Anim. 2024;59(1):e14501.
[2]. Agerholm JS, Hewicker-Trautwein M, Peperkamp K, Windsor PA. Virus-induced congenital malformations in cattle. Acta Vet Scand. 2015;57:54.
[3]. Agerholm JS. Inherited disorders in Danish cattle. APMIS. 2007;115(s122):1–76.
[4]. Muirhead TL, Pack L, Radtke CL. Unilateral notomelia in a newborn Holstein calf. Can Vet J. 2014;55(7):659–662.
[5]. Morath-Huss U, Drögemüller C, Stoffel M, Precht C, Zanolari P, Spadavecchia C. Polymelia in a chimeric Simmental calf: nociceptive withdrawal reflex, anaesthetic and analgesic management, anatomic and genetic analysis. BMC Vet Res. 2019;15(1):102.
[6]. Leipold HW, Dennis SM. Congenital defects of the bovine central nervous system. Vet Clin North Am Food Anim Pract. 1987;3(1):159–177.
[7]. Kim C, Yeo S, Cho G, Lee J, Choi M, Won N, et al. Polymelia with two extra forelimbs at the right scapular region in a male Korean native calf. J Vet Med Sci. 2001;63(10):1161–1164.
[8]. Pourlis A, Papatsiros VG, Athanasiou LV, Maragkakis GG, Tsioli V. Notomelia in a piglet (Sus scrofa): Case report and review of the literature. Anat Histol Embryol. 2019;48(4):384–387.
[9]. Munif MR, Safawat MS, Hannan A. Surgical correction of polymelia in the perineal region of a 2-day-old indigenous bovine calf: a case report. Bull Natl Res Cent. 2023;47:9.
[10]. Fubini SL, Ducharme NG. Farm Animal Surgery. 2nd ed. St. Louis, Missouri: Saunders; 2017.
[11]. Pavletic MM. Introduction to myocutaneous and muscle flaps. Vet Clin North Am Small Anim Pract. 1990;20(1):127–146.
[12]. Miesner MD. Bovine surgery of the skin. Vet Clin North Am Food Anim Pract. 2008;24(3):517–526.