**Abstract**

Objectives

This study investigated variables associated with surgical site infection (SSI) in dogs with cranial cruciate ligament rupture managed with stifle joint examination and lateral fabellotibial suture stabilisation.

Study design

A retrospective study of dogs that had stifle arthroscopy, stifle arthrotomy, or a combination of both, followed by lateral fabellotibial suture stabilisation for cranial cruciate ligament rupture. All cases had minimum follow-up of 90 days. Lameness grades were recorded pre-operatively, and at six-week and final follow-up.

Results

150 procedures in 130 dogs met the inclusion criteria. Overall SSI rate was 17.3% and removal of the lateral fabellotibial suture was performed in 53% of SSI. Multivariable analysis showed significant association between SSI and bodyweight (*P =* 0.013), and induction using propofol (*P =* 0.029). Multilevel ordinal logistic regression analysis showed a greater proportion of dogs had a higher lameness grade at six-week (*P =* 0.021) and final follow-up (*P =* 0.002) assessments in the infected compared to non-infected dogs.

Conclusion

Our study demonstrated a higher SSI incidence than previously reported in dogs undergoing a lateral fabellotibial suture for cranial cruciate ligament rupture. Bodyweight and induction with propofol were identified as significant risk factors for post-operative SSI. Owners could be advised of an increased SSI risk in larger dogs and consideration should be given to selection of induction agent. Dogs that develop an SSI have a worse lameness grade at six-week and final follow-up.

Keywords: Surgical site infection, Lateral fabellotibial suture, propofol, bodyweight, cranial cruciate ligament, dog

**Introduction**

Cranial cruciate ligament rupture is the most common cause of pelvic limb lameness in dogs (1) resulting in inflammation, pain, joint instability and osteoarthritis (2, 3). Numerous surgical treatment options have been proposed and have been grouped by extra-capsular, intra-articular or osteotomy techniques (4). Lateral fabellotibial suture is an extra-capsular technique first described in 1970 (5). A heavy non-absorbable suture material is placed around the sesamoid of the lateral head of the gastrocnemius tendon and through bone tunnel(s) made in the tibial tuberosity mimicking craniocaudal restraint of the cranial cruciate ligament (6). Previous studies comparing lateral fabellotibial suture to tibial plateau levelling osteotomy for cranial cruciate ligament rupture have conflicting conclusions with no significant differences in peak vertical force or time to normal function at walk identified by some (7, 8), whilst others have shown improved results for tibial plateau levelling osteotomy managed dogs (9, 10). However, lateral fabellotibial suture still remains a popular technique for stabilisation of the cranial cruciate deficient stifle and has a good to excellent clinical outcome in 75% to 82% of dogs (9, 11-13).

Surgical site infection (SSI) rates following surgical management of cranial cruciate ligament rupture range from 3 – 26% (14-22). Two previous studies examining arthrotomy and lateral fabellotibial suture for the management of cranial cruciate ligament rupture reported infection rates of 3.9 – 4.2% (12, 20). Meniscectomy, surgeon experience, breed, post-operative antibiotics, implant selection, anaesthetic and surgical times, bodyweight and use of skin staples have all been implicated as risk factors for SSI following stifle surgery in dogs (14, 16-21).

The United States Centres for Disease Control and Prevention (CDC) guidelines for classifying SSI have recently been updated to include infections developing up to 90 days after surgery where an implant is used (23). The CDC guidelines are published for use in human specific surgeries however are often adapted for veterinary SSI investigations (16, 24-26). These guidelines also designate grade of infection as superficial, deep and organ/space based on predetermined descriptions (23).

To the authors’ knowledge there is no recent literature stating overall SSI rate for lateral fabellotibial suture or investigating variables associated with SSI following lateral fabellotibial suture placement using the updated CDC guidelines. We hypothesised the true overall SSI rate would be higher than previously reported.

**Material and methods**

*Data collection*

Collection of anonymised clinical data from the hospital database was approved by the institutional research ethics committee (VREC677). Clinical records of dogs that had been diagnosed with cranial cruciate ligament rupture and were managed with lateral fabellotibial suture in the period from 1 January 2008 to 30 June 2018, were reviewed. Dogs were included for analysis if they met the following criteria: 1) follow-up was at least 90 days and 2) the affected stifle joint was explored by arthroscopy, lateral parapatellar arthrotomy, or a combination of both. Dogs were excluded if: 1) surgery had been performed on the stifle joint for a condition other than cranial cruciate ligament rupture or another stabilisation technique had been performed 2) The CDC guidelines were not met or 3) they had incomplete medical records. Surgical site infection was assigned retrospectively based on clinical description, culture of the implant or synovial fluid analysis according to adapted CDC guidelines (23) including the designation as superficial, deep or organ/space SSI (23). Subjective lameness was graded 0-5 (27) (see Table 1) by the examining veterinarian (ECVS/RCVS boarded surgeon or ECVS resident) at scheduled six-week follow-up and final follow-up.

*Surgical technique*

Surgical preparation was as previously described (28). In brief, the limb was aseptically prepared using 4% chlorhexidine gluconate scrub followed by 4% chlorhexidine gluconate in 70% ethanol mixed in a 1:9 ratio before being transferred to theatre for initial quarter draping and final large sterile drape isolating the limb. In cases where arthroscopy was performed, a 2.4mm or 2.7mm arthroscope (Karl Storz, Germany) was used depending on surgeon preference and patient size. In cases converted to arthrotomy or where arthrotomy was the chosen primary procedure, a lateral parapatellar approach to the stifle was performed (29). The intra-articular structures were probed using an arthroscopic 2.2mm hook probe (Dr Fritz GmbH, Tuttlingen, Germany). The presence of meniscal tears was noted and, displaced or unstable meniscal tears were treated by partial meniscectomy or hemi-meniscectomy. Partial and complete cranial cruciate ligament ruptures were assigned as previously defined (30) . Following inspection of the joint, placement of the lateral fabellotibial suture (Securos® UK, Coventry, UK) was performed as previously described (6). The tensile strength of the nylon leader line and the number of sutures placed was based on the bodyweight of the dog and surgeon preference.

*Peri-operative management*

All dogs received an intramuscular pre-medication with a sedative and/or anxiolytic drug combined with a pure µ-agonist opioid. Induction of general anaesthesia was performed using either intravenous propofol(PropoFlo® or PropoFlo Plus®, Abbott Animal Health, UK) or alfaxalone (Alfaxan®, Jurox (UK) Ltd, UK) to effect. All dogs received either epidural or regional anaesthesia as part of a multimodal analgesic protocol. Amoxicillin/clavulanate (20mg/kg IV) (Augmentin, GlaxoSmithKline) or cefuroxime (20mg/kg IV) (Zinacef, GlaxoSmithKline) were used for perioperative antibiotic therapy after induction and repeated every 90 minutes for the duration of the surgery. Post-operative antibiotics were prescribed at the discretion of the surgeon and recorded. As standard of care all dogs had a self-adhesive wound dressing (Primapore®, Smith and Nephew UK and Ireland, UK) applied to the surgical site post-operatively. Owners were instructed to present their dog at the referring veterinary practice 10 days post-operatively for removal of the skin sutures or staples. Exercise instructions were standardised for every case where dogs were strictly confined for the first two weeks followed by controlled rehabilitation over six weeks.

*Statistical analysis*

Sample size calculations indicated that to estimate the prevalence of infection with a precision of +/- 5% and an expected prevalence of approximately 10%, a total of 138 cases would be required. All statistical analyses were carried out using the statistical software SPSS 22.0 (SPSS Inc, Chicago, Illinois, USA), MLwiN (version 3.02, Centre for Multilevel Modelling, University of Bristol, UK) and R (R version 3.2.0, The R Foundation for Statistical Computing). Independent variables were generated from signalment data, surgical records and patient follow-up. Variables examined are presented in Table 2.

Descriptive statistics were calculated for variables; continuous data were summarised as median values with interquartile ranges (IQR), and categorical data as frequencies with 95% confidence intervals (95% CI). For categorical variables with many categories and/or categories containing only limited numbers, amalgamation of groups was performed. For a continuous variable, the functional form (shape) of the variable with respect to the outcome was assessed using generalised additive models (GAM). GAM models were fitted using cubic spline smoothers and tested for departure from linear trend to determine whether an assumption of linear association was valid. Normality of distribution for continuous variables was examined using the Kolmogorov-Smirnov test.

Individual canine stifle joints were considered the unit of interest; the binary outcome for each was the presence or absence of an SSI following surgery. As some cases represented dogs undergoing bilateral procedures, the two resultant outcomes are not independent. Consequently, analyses were performed using multilevel logistic regression models, with within-dog clustering of stifles accounted for by inclusion of a random intercept term. All variables that showed some association with SSI on initial univariable analysis (a *P*-value <0.25) were considered for incorporation into the multivariable model. Paired independent variables with a correlation coefficient of >0.70, had the variable with the smallest *P*-value selected for analysis. The model was constructed by a manual backwards stepwise procedure with retention of variables with Wald *P*-values < 0.05. Potential confounders were identified by examining parameter estimates for substantial changes following their removal.Interaction terms were tested for the variables remaining in the final model. Differences in lameness grades between groups (infected/non-infected and procedure type) were analysed using univariable multilevel ordinal regression, again within-dog clustering of stifle joints was accounted for by inclusion of a random intercept term.

***Results***

*Descriptive statistics*

A total of 162 lateral fabellotibial suture procedures met the inclusion criteria, of which two dogs were euthanised for unrelated reasons and ten dogs were lost during the follow-up period, leaving a total of 150 procedures carried out on 130 dogs. The median age was 68.8 months (IQR 37.3-94.8 months) and median weight was 30.5kg (IQR 19.5-38.2kg). Dog breeds included were crossbreeds (n=30), gundog-types (n=17), utility-types (n=17) Labrador retrievers (n=15), terriers-types (n=15), working-types (n=12), Rottweilers (n=9), pastoral types (n=8) and seven dogs from breeds represented by 3 dogs. Female-neutered were represented by 56 dogs, male-neutered by 47 dogs, male-entire by 15 dogs and female-entire by 12 dogs.

Lateral fabellotibial sutures and arthrotomy or arthroscopy or combined accounted for 39, 88 and 23 procedures respectively. The median follow-up duration was 605 days (IQR 212-1519 days). Overall median surgical and anaesthetic times were 82 minutes (IQR 60-110) and 145 minutes (IQR 120-170) respectively. Post-operative antibiotics were prescribed in 20/150 cases. These included amoxicillin/clavulanate (13/20) (10-22mg/kg PO BID, duration 4-14 days), cefalexin (6/20) (12-26mg/kg PO BID, duration 5-21 days) and clindamycin (1/20) (6mg/kg PO BID, duration 7 days).

Post-operative SSI were diagnosed in total of 26/150 procedures (17.3%; 95% CI 12.1-24.2%), with no dog having more than one SSI. Classifications of SSI included 4 superficial, 3 deep and 19 organ/space. The median time to infection was 35 days (IQR 20-67). All superficial SSI occurred within 4-20 days of surgery. Cytology was performed in 21/26 SSI with the median cell count recorded (16/21) as 38.3x109 (IQR 27.5-70.9) and the median percentage neutrophil count (19/21) recorded as 86.5% (IQR 80.5-92.3). There were two dogs with lameness grade 2, two with grade 3, six with grade 4 and twelve with grade 5 at time of SSI diagnosis. Bacterial isolates cultured included *Staphylococcus pseudintermedius* (n =10), *Staphylococcus aureus* (n =6),Methicillin-resistant *Staphylococcus aureus* (MRSA) (n =2) and *Staphylococcus warneri* (n =1).

All SSI were prescribed antibiotics including amoxicillin/clavulanate (19/26) (10-23mg/kg PO BID), cefalexin (5/26) (13-22mg/kg PO BID) and trimethoprim/sulphonamide (2/26) (17-18mg/kg PO BID). The median antibiotic course was 32 days (IQR 28-42), range 5-56 days). Of the 26 SSI dogs, 14 (53%) had removal of the lateral fabellotibial suture.

Additional descriptive results with median, interquartile range (IQR) and absolute ranges are reported in **Supplementary Table 1.**

*Associations between independent variables and SSI*

None of the continuous variables demonstrated a significantly non-linear relationship with the outcome considered and so all were available to consider for inclusion in the logistic regression analysis. None of these continuous variables demonstrated a normal distribution.

Univariable analysis showed some evidence of association (*P* <0.25) with the development of SSI and bodyweight, surgeon, induction agent, complete cranial cruciate ligament rupture, number of implants and skin closure method (Table 3). Following construction of the final multivariable model, significant associations with SSI were confirmed only for bodyweight and induction agent (Table 4). The use of propofol as an induction agent (odds ratio [OR] 3.6; 95% CI 1.14-11.5, *P* =0.029) and increasing bodyweight (OR 1.04; 95% CI 1.01-1.08, *P* =0.013) resulted in increased risk of SSI.

*Association between lameness grade and SSI*

There was a greater proportion of higher lameness grades at six-week assessment (*P =*0.021) and final assessment (*P =*0.002) (Figure 1A and 1B) in dogs with SSI compared to dogs without SSI. Number of days post-operatively of final assessment was not significantly different between dogs with SSI (median 103 days, IQR 54-181) and non-infected dogs (median 76 days, IQR 46-172).

**Discussion**

The results of this study support our hypothesis that SSI rate following lateral fabellotibial suture as defined using the updated CDC guidelines (23) would be higher than previously reported.

The overall SSI in this study was 17.3% which is similar to a recent prospective tibial plateau levelling osteotomy study (21) but is higher than in previous studies reporting outcomes for lateral fabellotibial suture where SSI incidences of 3.9 – 4.2% were identified (12, 20). Casale and others (2009) reported an infection rate of 3.9%, following lateral fabellotibial suture, based on a positive bacterial culture after arthrocentesis or deep the incision. Incisional complications treated empirically with antimicrobials and were not classified as infected, in contrast to CDC guidelines (23). The disparity in definition of SSI at the time of this report (12) and selected criteria for infection may explain in part, the difference in our study and previous reports on SSI (12, 20). Sensitivity of synovial fluid culture in dogs with septic arthritis was 44 – 56% in previous studies (31, 32) potentially leading to underestimation of SSI if only positive culture is considered diagnostic. Our definition for infection was based on updated CDC guidelines with a permanent implant (23). Synovial fluid criteria for discerning a positive SSI was as previously reported for septic arthritis (32) ensuring dogs that had clinical and cytological agreement with SSI, were included as an SSI in our study. Additionally, previous studies on SSI following lateral fabellotibial suture have only included data from dogs presenting back to the institution (12, 20). In our study a more proactive approach was taken; follow-up data was obtained by telephone contact to the referring veterinarian ensuring a more accurate representation of the true SSI rate.

Following multivariable analysis of our data, increasing bodyweight was found to be a significant risk factor for SSI with every 1kg in bodyweight representing a 4% increased risk of SSI. Based on this, odds of SSI in a 40kg dog undergoing lateral fabellotibial suture was 3.24 times greater than a 10kg dog. Bodyweight has been highlighted in previous studies as being associated with developing an SSI in orthopaedic surgery (12, 19, 21, 33). Previous studies suggest heavier dogs may impart more mechanical stress on surgical wounds citing behavioural differences between large- and small-breed dogs as a reason for bodyweight as a SSI risk factor (20, 34). Like those studies, body condition score was not evaluated in our study, this limitation means association between BCS and SSI could not be made.

We also found a significant relationship between propofol use and SSI, with induction using propofol resulting in a 3.6 times higher risk of post-operative SSI. This was in agreement with previous veterinary literature (35). The confidence intervals associated with this finding are wide, reflecting the relatively small sample size. Nevertheless intravenous propofol has been identified as a risk factor for SSI in several human studies (36-40). Propofol formulations with microbial inhibitors and adherence to stricter asepsis significantly decreased human infections (40). Propofol formulations with antimicrobial preservative were not introduced at our institution until 2011 however we found no significance associated with SSI and year of surgery as a main effect and interaction effect with induction agent in our statistical analyses. Propofol has also been shown to significantly enhance host susceptibility to infection by inhibiting recruitment and activity of immune cells (41, 42) which may have contributed to our findings. Conversely propofol is commonly used in anaesthesia due to its high safety profile, rapid onset and short action (43-45).

All 26 SSI were initially treated with a course of antibiotics based on surgeon preference and available bacterial sensitivity. Of these 26 dogs, 53% had removal of the lateral fabellotibial suture for management of the SSI which compares slightly more favourably than the 71% of dogs which required lateral fabellotibial suture explantation for SSI management in a previous study (12). The high percentage of implant explantation was attributed to aggressive management of SSI (12) which was consistent with our study. Additionally in our study all bacterial isolates were Staphylococcal infections which are known to produce implant bio-films (26, 46, 47) requiring implant explantation.

There is conflicting evidence on the effect of prophylactic antibiotics prescribed following orthopaedic surgeries (16, 18, 19, 21, 33). In our study, 13% of animals were prescribed post-operative antibiotics, however there was no evidence that post-operative antibiotics were associated with either increased risk or protection against SSI (*P* =0.753). According to published antibiotic dose ranges (48), two dogs were underdosed, possibly limiting any conclusions regarding antibiotic effect on SSI.

Increased anaesthetic duration, surgical time, method of skin closure, meniscectomy and surgeon experience have been significantly associated with SSI in previous veterinary orthopaedic studies (16-22) but none of these variables were found to be significantly associated with development of SSI in ours and previous studies (14, 21, 33, 49).

Human CDC guidelines for classification of SSI have recently been updated to include infections developing up to 90 days after surgery where an implant is used (23). No veterinary-specific guidelines are established and therefore veterinary literature often cite previous CDC guidelines for SSI investigations (16, 24-26). The previous CDC guidelines defined an SSI up to a year after surgery where an implant was placed (50). The majority of SSI in previous stifle surgery studies occur within 90 days of surgery (18, 19, 25, 51). Applying the previous CDC guidelines (50) would have resulted in a further six dogs being classed as having a SSI in our study (with infections documented from 139 to 310 days post-surgery).

When comparing lameness grades, there were significantly greater proportion of dogs with higher lameness grades if an SSI was confirmed at any point post-operatively in comparison to non-infected animals. There is a scarcity of data on outcome following SSI at short- and medium-term assessment however, given the significant inflammatory response associated with SSI, it was not unsurprising that there was a greater proportion of dogs with higher lameness grades at short-term and final follow-up assessments.

The major limitation to this study is its retrospective nature. Follow-up data was gathered from referring veterinary practices when a 90-day follow-up was not met which relied on accurate data gathering from the referring veterinary practice. Also, a cohort of patients that had clinical signs of superficial SSI that were managed without oral antibiotics or veterinary care may not have been included as infected in the data.

Another limitation is the inherent risk of bias using a subjective scale to assess lameness (27). Given the technical challenges and specific equipment needed for objective gait analysis, veterinary orthopaedic studies often evaluate lameness using a similar subjective grading systems (27, 52-54).

In conclusion, our study shows that both bodyweight and induction with propofol are significant risk factors for post-operative SSI in dogs undergoing a lateral fabellotibial suture. Therefore, owners could be advised of SSI risk in larger dogs, and SSI should be considered when deciding on induction agent for lateral fabellotibial suture procedures. A separate conclusion was dogs that develop an SSI have a significantly worse lameness grade at six-week and final follow-up assessments compared to dogs without SSI.

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Figure legends

Figure 1A – Pyramid plot illustrating and comparing the number of dogs in each lameness grade (0 – 5) between infected and non-infected dogs at six-week assessment.

Figure 1B - Pyramid plot illustrating and comparing the number of dogs in each lameness grade (0 – 5) between infected and non-infected dogs at final assessment.

Tables

|  |  |
| --- | --- |
| **Lameness Grade** | **Lameness description** |
| 0 | No lameness present |
| 1 | Intermittent mild weight-bearing lameness with little if any change in gait |
| 2 | Consistent mild weight-bearing lameness with little change in gait |
| 3 | Moderate weight-bearing lameness |
| 4 | Severe weight-bearing lameness |
| 5 | Non-weight-bearing lame |

Table 1 – Lameness grade and associated lameness description used for lameness assessment

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variable** | **Category** | **SSI/n** | **n/N** | **P Value** |
| **Procedure** | Arthroscopy | 19/88 | 88/150 | (ref) |
|  | Arthrotomy | 4/39 | 39/150 | 0.134\* |
|  | Combined arthroscopy + arthrotomy | 3/23 | 23/150 | 0.365 |
| **Breed Category** | Crossbreed | 4/30 | 30/130 | (ref) |
|  | Terrier-type | 1/15 | 15/130 | 0.497 |
|  | Labrador | 6/15 | 15/130 | 0.038\* |
|  | Pastoral-type | 3/8 | 8/130 | 0.168\* |
|  | Working-type | 3/12 | 12/130 | 0.123\* |
|  | Utility-type | 4/17 | 17/130 | 0.755 |
|  | Gundog-type | 3/17 | 17/130 | 0.596 |
|  | Rottweiler | 1/9 | 9/130 | 0.828 |
|  | Other | 1/7 | 7/130 | 0.932 |
| **Weight** | Kilograms |  | 150/150 | 0.008\* |
| **Age** | Months |  | 150/150 | 0.377 |
| **Students** | Not present | 11/58 | 58/150 | (ref) |
|  | Present | 15/92 | 92/150 | 0.675 |
| **Induction** | Alfaxalone | 4/51 | 51/145 | (ref) |
|  | Propofol | 21/94 | 94/145 | 0.036\* |
| **Peri-operative Antibiotics** | No | 2/10 | 10/142 | (ref) |
|  | Yes | 24/132 | 132/142 | 0.886 |
| **Peri-operative Antibiotic type** | None | 2/10 | 10/142 | (ref) |
|  | Amoxicillin/Clavulanate | 20/94 | 94/142 | 0.947 |
|  | Cefuroxime | 4/38 | 38/142 | 0.355 |
| **Surgery Time** | min |  | 139/150 | 0.939 |
| **Anaesthesia Time** | min |  | 141/150 | 0.326 |
| **Surgeon** | Resident | 8/67 | 67/150 | (ref) |
|  | Boarded | 18/83 | 83/150 | 0.122\* |
| **Skin Closure Technique** | Intradermal | 1/20 | 20/130 | (ref) |
|  | Staples | 10/41 | 41/130 | 0.096\* |
|  | Suture | 12/69 | 69/130 | 0.196\* |
| **Cranial Cruciate Ligament Rupture** | Partial | 6/22 | 22/150 | (ref) |
|  | Complete | 20/128 | 128/150 | 0.189\* |
| **Medial Meniscal Injury** | No | 18/89 | 89/149 | (ref) |
|  | Yes | 8/60 | 60/149 | 0.28 |
| **Type of Medial Meniscal Injury** | None | 18/89 | 89/148 | (ref) |
|  | Bucket handle tear | 4/25 | 25/148 | 0.707 |
|  | Flap tear | 4/27 | 27/148 | 0.597 |
|  | Complex tear | 0/7 | 7/148 | 0.639 |
| **Number of Implants** | Range 1 - 4 |  | 113/150 | 0.046\* |
| **Late Meniscal Injury** | No | 22/130 | 130/150 | (ref) |
|  | Yes | 4/20 | 20/150 | 0.735 |
| **Post-operative Antibiotics Prescribed** | No | 22/130 | 130/150 | (ref) |
|  | Yes | 3/20 | 20/150 | 0.753 |

Table 2 – Variables, associated categories, proportion of cases in category with SSI recorded (SSI/n) and, proportion of cases with variable recorded (n/N) included for statistical analysis. Reference (ref) categories are included and those with evidence of association (*P* <0.25) with development of SSI (\*)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable** | **Category** | **OR** | **L95%CI** | **U95%CI** | **P-Value** |
| Bodyweight | Kg | 1.045 | 1.012 | 1.078 | 0.008 |
| Induction agent | Propofol | 3.355 | 1.082 | 10.406 | 0.036 |
| Surgeon | Boarded | 2.042 | 0.827 | 5.043 | 0.122 |
| Skin closure | Staples | 6.129 | 0.727 | 51.674 | 0.096 |
| Skin closure | Suture | 4 | 0.488 | 32.778 | 0.196 |
| Complete cranial cruciate ligament rupture |  | 0.537 | 0.172 | 1.415 | 0.189 |
| Number of  implants |  | 0.499 | 1.016 | 7.191 | 0.046 |

Table 3 – Univariable results table highlighting variables with some evidence of association (*P* <0.25) with development of SSI, including bodyweight, induction agent, surgeon, skin closure method, complete cranial cruciate ligament rupture and number of implants.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable** | **Category** | **OR** | **L95%CI** | **U95%CI** | **P-Value** |
| Bodyweight | Kg | 1.044 | 1.009 | 1.081 | 0.013 |
| Induction agent | Propofol | 3.613 | 1.139 | 11.458 | 0.029 |

Table 4 – Multivariable results table highlighting univariable variables (bodyweight and induction with propofol) with significant association with SSI (*P<*0.05).