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| 1 | A novel tension relief technique to aid the primary closure of traumatic equine |
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| 2 | wounds under excessive tension |
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| 15 | |
| 16 | |
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| 19 | Pollock and Ian Fulton primary surgeons and contributed to the manuscript. Charlotte Hewitt- |
| 20 | Dedman assistant surgeon and help in the data analysis. Ian Handel analysed the data and contributed |
| 21 | to the manuscript. Dylan Gorvy, primary surgeon, developed the idea for the technique, analysed the |

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Background: To achieve an excellent functional and cosmetic result, primary closure is preferred
over leaving wounds to heal by secondary intention. However, traumatic wounds are often under
excessive tension during wound closure and incorrect suture technique can compromise
microcirculation, leading to skin necrosis and impaired wound healing.

- 48 **Objective:** To describe an inexpensive and effective tension relief technique that helps the successful
- 49 primary closure of a variety of equine wounds at high risk of dehiscence.
- 50 Study design: Retrospective case series.

51 Methods: All wounds that were managed with the Tension Tile System (TTS) at four Equine 52 Hospitals between March 2017 and May 2021 were evaluated. The wounds were classified according 53 to various criteria including anatomical location, time elapsed prior to surgery, depth of wound, and 54 post-surgical use of immobilisation. Outcome criteria was based on the success of primary intention 55 healing. The duration of convalescence (weeks) after surgery was also recorded.

Results: During the study period, the TTS was used in 191/860 (22%) wounds repaired under general
anaesthesia or standing sedation. Overall, primary intention healing (Group A) was achieved in 132
out of 191 cases (69%, CI 62%-75%), with partial dehiscence (Group B) in a further 30/191 cases
(16%, CI 11%-22%). Severe dehiscence (Group C) was recorded in 29/191 cases (15%, CI 11%21%). The median convalescence time was 4 weeks (Range 3-15, IQR 4-6) in Group A.

Main limitations: Retrospective nature of the study and subjective outcome assessment. The
technique was applied to wounds under significant tension; however, this was based on a subjective
assessment by the surgeons involved.

64 Conclusions: The Tension Tile System is an economical and effective technique for challenging65 equine wounds under tension, in a variety of anatomical locations.

66 **1.INTRODUCTION**

In order to achieve an excellent functional and cosmetic result, every attempt should be made to close 67 wounds primarily. Second-intention healing is a protracted process, and at a high risk of complications 68 69 such as chronic inflammation, the development of exuberant granulation tissue, poor wound contraction and slow epithelialization. This is of particular relevance to the distal limb.¹ In addition, 70 the thin epithelial cell layer that accompanies second intention healing makes these wounds far more 71 susceptible to trauma compared to normal skin, particularly in areas of high mobility.² However, 72 primary intention healing can be challenging to achieve and in a large retrospective study, complete 73 74 primary healing after closure of traumatic wounds was successful in only 26% of horses and 41% of 75 ponies.³

Traumatic equine wounds are often under excessive tension either during or following closure. This 76 can result in circulatory compromise, skin necrosis, and wound dehiscence. The tension on the skin 77 margins can be defined as static or dynamic. Static tension refers to the tension lines of the skin at 78 79 rest and it is important to consider during closure or debridement. This is especially relevant for wounds with a skin defect or that have undergone significant contraction prior to closure. Dynamic 80 tension is generated during movement and is particularly important for wounds over or near an area 81 of high mobility or those oriented perpendicular to lines of skin tension.⁴⁻⁶ Depending on the location, 82 83 wounds can have a combination of both static and dynamic tension.

Multiple suture techniques have been described to decrease the tension required for wound apposition, however, under high tension, these do not prevent sutures cutting through the skin.⁷ Quills or stents can be incorporated into the sutures, however, in our experience they do not adequately distribute the pressure and avoid the risk of focal skin necrosis.

A recent study by Dannemiller et al., demonstrated the importance of a wide surface area in contact
with the skin to prevent pressure related damage in the dolphin. In addition, in human surgery, tension
relieving devices with a large contact area are used to decrease this risk.⁸⁻¹⁰

91 Skin is a heterogenous viscoelastic tissue that is capable of further extension beyond its initial 92 elasticity with the application of a stretching over time. These inherent properties, called mechanical 93 creep and complemented by stress relaxation, can be harnessed to aid wound closure.⁹⁻¹² There are 94 several commercial tension relieving systems available for use in human surgery, however these are 95 expensive and have not been validated or their use well established for equine wounds.^{9,13-14} The 96 TopClosure system has been reported in a small equine case series, however, the outcome was poor, 97 in agreement with our own personal experience.¹⁵

98

99 In the following retrospective case series, we describe a modified form of an inexpensive and effective 100 tension relief technique, called the Tension Tile System (TTS). This is designed to take advantage of 101 the mechanical properties of the skin and has been used successfully in a small case series of human wounds.¹⁶ Using this system, we were successfully able to close a wide variety of equine wounds
under high static tension or anticipated dynamic tension.

104

105 2. MATERIALS AND METHODS

106 **2.1** Case selection

107 Clinical and surgical patient records were reviewed for all horses that presented with traumatic wound 108 to four referral Equine Hospitals in Sweden, the UK, and Australia between March 2017 and 109 December 2021. Wounds managed with the TTS were selected and evaluated. All surgical procedures 110 were performed by registered specialist surgeons, either an ECVS diplomate or a registered surgery 111 specialist of the ANZCVS, were included.

Patients were excluded if the data <u>in the medical record</u> were not detailed enough to categorize the
wound and fully evaluate the outcome.

114

115 **2.2 Classification of cases**

116 A total of 191 patients fulfilled the inclusion criteria. The following data was recorded: Age (median 117 and interquartile range), breed (Warmblood, Standardbred, Thoroughbred and other) and whether a horse or pony (< or =148cm). Using a modified classification system after Wilmink et al. (2002), the 118 wounds were categorized according to the following criteria: anatomical location (distal limb, carpus, 119 120 tarsus, proximal limb, body and head/neck), time elapsed prior to surgery (0-24 hours, 2-7 days, 8-21 days, > or = 22 days), depth of wound at the deepest point (skin, subcutis, muscle, bone), complicating 121 factors (open synovial cavity, traumatised tendon, exposed bone, none), and post-surgical use of 122 123 immobilisation (categorised as yes or no).³

The application of a cast, bandage cast, splint, or full Robert Jones Bandage were considered rigid
 immobilisation.¹⁷

Distal or proximal limb wounds were defined as a wound located distal or proximal to the carpus ortarsus respectively.

129 **2.3 Treatment protocol**

All patients received pre-operative flunixin meglumine (Finadyne; 1.1 mg/kg bwt i.v.;MSD Animal
Health Sweden) and sodium benzylpenicillin (Geepenil, 12 mg/kg bwt i.v.; Orion Pharma Animal
Health). Gentamicin (Gentaject, 6.6 mg/kg bwt i.v.; Ceva Animal Health) was also administered if a
synovial structure or bone was involved. Following clipping and sterile surgical preparation, wounds
were debrided by sharp surgical dissection and if available, with the use of the VersajetTM
hydrosurgery system (Smith and Nephew, UK), to remove contamination and necrotic tissue.¹⁸

136

137 2.4 Tension Tile (TT) Surgical Technique

The plastic backing of a standard sterile suture pack (0 USP polyamide, Ethilon, Ethicon US) was 138 used as an attachment plate (Tension Tile, TT). A sterile foam dressing with silicon adhesive (Mepilex, 139 140 Mölnlycke Healthcare, Sweden) was cut to shape, and affixed to the tile to reduce skin pressure (Fig. 141 1 A,B). The TTs were attached to the skin with four 0 USP polyamide sutures on either side of the 142 wound, such that the leading edge of the plate was approximately 5 -10 mm from the wound margin 143 (Fig. 2 A,B,C). In cases where there was a high degree of tension or when the plate was bent to achieve better contact with the skin, an additional one or two sutures (0 USP polyamide) were placed 144 145 on the long side away from the wound edge. Next, three horizontal mattress sutures were pre-placed, 146 using 2 USP polyamide sutures. The sutures were passed through the TT and the skin on either side 147 of the wound margin (Fig. 2B). The wound edges were then apposed with 1 USP and 0 USP polyamide using a combination of a horizontal mattress and simple interrupted suture pattern (Fig. 2C). Intra-148 149 operative skin stretching was maintained using a modified 135 mm fragment forceps (ref. no. 001208M, Veterinary Instrumentation UK), and given the acronym GTA "Gorvy Tissue 150 Approximator". Compared with a standard Backhaus towel clamp, the increased length of the ratchet 151 enabled differing degrees of tension to be applied without overlapping the wound margins (Fig. S1 152 153 A,B,C).

Finally, the pre-placed horizontal sutures were tied, transmitting all the shearing force to the TT, in turn distributing it to a large healthy skin surface area (Fig. 3A,3B). If the wound was located over a tendon, to avoid trauma from the subcutaneous suture material, the pre-placed 2 USP polyamide sutures were passed through the TT and the skin, using an interrupted cushings pattern, crossing the wound margins over the plate (Figure 3C). When this technique was used, normally only two sutures could be placed, due to limited space.

160 When appropriate, a drain was inserted prior to wound apposition. If possible, an active suction drain161 (Redon drain, Primed, Germany) was preferred to a passive drain.

162 The duration of postoperative NSAIDs was based on the type of wound and clinical status of

163 the patient, but usually for no more than three days. As a routine, antimicrobials were administered 164 for three days or until the drain was removed. This was extended in cases with complicating factors 165 such as bone or synovial structure involvement.

166

167

168 2.5 Outcome criteria

169 Using a modified grading system after Wilmink et al., wounds were classified based on the success

170 of primary intention healing at two weeks after surgery, the standard time for suture and TT removal

171 (Fig.4 A,B; Fig.S2 A,B,C; Fig.S3 A,B,C).³

172 The wounds were assessed subjectively by one of the surgeons (DG,PP,IF) and two residents

173 (FC,CHD) using photographs of the wound and/or the description in the clinical report. The wounds

174 were divided into three groups: Group A - no dehiscence, Group B - partial dehiscence (>0% and 40%

175 of wound length), and Group C - severe dehiscence (>40% - complete).

176 Duration of convalescence (weeks) after surgery was also recorded. Convalescence was defined as

177 the time needed before return to work or unrestricted turnout.

178

179 2.6 Statistical methodsData analysis

Data were recorded in Microsoft Excel and imported into the R statistical system (R Core Team 180 (2022). R: A language and environment for statistical computing. R Foundation for 181 StatisticalComputing, Vienna, Austria. URL https://www.R-project.org/.) organization, 182 for explorationand statistical analysis. Data were managed and plotted using functions from the 183 tidyverse¹⁹ and janitor packages (Sam Firke (2021). Janitor: Simple Tools for Examining and 184 Cleaning. R version 2.1.0. https://CRAN.R-project.org/package=janitor). Success rates for specific 185 subgroups were reported as proportions with 95% confidence intervals using Clopper/Pearson 186 187 methodology.

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3. RESULTS

During the study period (March 2017 to December 2021), 860 wounds were repaired under general
anaesthesia. Of these, 191 (22%) were repaired with the Tension Tile System and met the criteria for
inclusion in the study (Table 1).

198 The age of patients ranged from three months to 23 years old (median 6 years; interquartile range 7). 199 The Swedish Warmblood was the most common breed represented (n=74, 38%), followed by the 200 Standardbred (n=33, 17%), pony breeds (n=26, 14%) and Thoroughbred (n=22, 12%). A variety of other breeds accounted for the remainder of animals treated, including the Quarter Horse and Arabian. 201 202 Overall, primary intention healing with zero dehiscence (Group A) was achieved in 132 out of the 203 191 cases (69%, CI 62%-75%). Partial dehiscence (Group B) occurred in a further 30 cases (16%, CI 11%-22%) and severe dehiscence (Group C) in 29 (15%, CI 11%-21) cases. The predominant causes 204 205 of failure in Group C were infection or ongoing tissue necrosis (Table 1). The outcome for the three surgeons is shown in Table 1, with primary closure achieved by the first surgeon in 71% of the wounds
(CI 63.1%-78%), the second surgeon in 89% (CI 51.8%-99.7%) and the third surgeon 52% (CI 31.971.3).

The success of primary healing in ponies was 88% (CI 69.8-97.6) and in horses 66.1% (CI 68.3-73.2)
(Table 1).

Distribution and outcome of wounds at different locations are reported in Table 1. Primary intention
healing was achieved in 75% (CI 59.7%-86.8%) on the proximal limb wounds, 74% (CI 51.6%89.8%) on the carpus, 71 % (CI 41.9%-91.6%), on the body 67% (CI 52.1%-79.2%) on the distal
limb, 65% (CI 51.4%-77.8%) on the tarsus and 50% (CI 51.4%-77.8%) on the head/neck.
In Group A, 48% of patients presented within 24 hours of injury and primary closure was achieved

in 67% of these wounds (CI 56.8-76.8). A further 40% presented between two days and three weeks

following trauma and in 12% of cases, the wounds were greater than 22 days old prior to presentation.

In 10% of chronic cases (more than two days old), unsuccessful closure had already been attemptedonce or twice prior to presentation.

220 Successful delayed primary closure was achieved in 65% of the wounds between 2-7 days (CI 49.5-

77.8), in 76% between 8-21 days (CI 56.5-89.7), and 77% in wounds presented after 22 days or more
(CI 54.6-92.2) (Table 1).

In 90/191 (47%) of cases, the wounds were complicated by the presence of an open synovial cavity,

the involvement of a tendon, or exposed bone (Table1). Primary healing was achieved in 76% of

- wounds involving an open synovial cavity (CI 54.9-90.6), 75% of wounds associated with tendon
- trauma and 67.6% of wounds with exposed bone (CI 50.2-82).
- Immobilisation was used after surgery in 114/191 (60%) of cases, with the distribution and outcomereported in Table 2.
- The median convalescence time was 4 weeks (Range 3-15, IQR 4-6) in Group A, 7 weeks (Range 4-
- 230 16, IQR 4-10.5) in Group B and 10 weeks (Range 5-16, IQR 8-12) in Group C. In 12 cases (6%),

animals were euthanized; two of these for reasons unrelated to the wound and the remainder due toongoing necrosis/infection (Table 1).

233

234 4.DISCUSSION

Optimal primary intention healing, in terms of cosmetic and functional outcome, is achieved when 235 surgical incisions are made with the tension lines of the skin taken into consideration, thereby 236 resulting in a tension free or near tension free closure. Unfortunately, traumatic equine wounds are 237 238 often under tension when attempting primary closure. This is due to poor wound orientation, skin contraction after injury, or traumatic skin loss either at the time of injury or from necessary 239 debridement to remove contaminated or necrotic tissue. The successful surgical management of these 240 wounds is related to the ability to release tension from the wound margins, so that the sutures do not 241 compromise the microcirculation. Therefore, choosing the correct technique is paramount to achieve 242 243 primary healing.

Our results demonstrate the effectiveness of the Tension Tile System (TTS) in a wide range of 244 245 anatomical locations, enabling the successful healing by primary intention of wounds that were 246 previously thought impossible to close. Primary intention healing was achieved in 69% of wounds overall, which is a marked improvement compared to a previous report where the equivalent overall 247 success was only 28%. ³ All surgeons were able to use the technique effectively with a high degree 248 249 of success. The proportion of wounds with zero dehiscence varied among surgeons, however the lowest success rate was 51%, almost double compared to previously reported data.³ Multiple factors 250 can affect the healing process and for this reason the difference between surgeons could be related to 251 252 a learning curve for the technique or factors not surgically related. In addition, the very restrictive and subjective grading system played an important role in the evaluation of dehiscence and may have 253 254 influenced the results.

255 The success rate in ponies was higher compared to horses, in agreement with previous findings.³

However further investigation is needed before a definitive conclusion can be made regardingpossible differences in primary wound healing.

Primary intention healing was achieved irrespective of the depth of the wound, complicating factors
or time elapsed prior to surgery. Meticulous preparation and application of the TTS enabled the
successful delayed primary closure of wounds.

261 Contamination, necrotic tissue, traumatised skin and unhealthy granulation tissue must be removed in both acute and chronic wounds, using a combination of surgical sharp and/or mechanical 262 263 debridement. Unfortunately, this often results in increased distance between the wound margins. However, the increased capacity to control tension using the TTS allows surgeons to debride the 264 265 wound more effectively without compromising the ability to attempt primary closure. This is 266 particularly important with traumatic wounds associated with complicating factors, such as tendon trauma, joint involvement, or exposed bone. In these cases, primary healing is critical, since 267 268 secondary intention healing may lead to an increase in the convalescence time and associated costs 269 of treatment. In particular, where a tendon is involved, continuous movement will impede the healing 270 due to the formation of different planes of granulation tissue.²

Partial degloving injuries are very challenging, as these wounds are often characterised by a combination of high tension and poor-quality skin margins. The application of the TTS enables tension management with an excellent distribution of pressure over a large skin surface area compared to traditional tension relief techniques; theoretically decreasing the risk of pressure necrosis or sutures cutting through the skin. The plates were left in place for 2 weeks, the standard time for suture removal, with no evidence of skin necrosis.

In this study, the use of rigid immobilisation was subjectively decided by the surgeon, taking into consideration the degree of 'dynamic tension' anticipated. The Tension Tile System works predominantly against 'static tension', by taking advantage of mechanical creep and stress relaxation, but can counteract dynamic tension to a certain extent. However, the post-surgical dynamic tension on the skin, generated during movement, can overload the system. For wounds with potentially high dynamic tension, the authors advise the use of immobilisation in addition to the TTS. This combination can create a perfect synergy to counteract all the tension forces generated. However, a prospective randomized study needs to be performed to assess the advantage of immobilization in addition to the TTS.

Failure to achieve complete primary closure was associated with an increased convalescence time. 286 This finding is in accordance with a previous study that reviewed healing of traumatic wounds 287 associated with extensor tendon lacerations, where a significant association between primary healing 288 and the return to soundness of the patient was reported.²⁰ Achieving complete primary healing in a 289 290 short time permitted horses to start rehabilitation earlier, which could have a positive effect. An 291 extended convalescence period, with the horse restricted to a box or small paddock, may lead to a 292 loss of athletic condition and increased risk of behavioral problems. Time spent in convalescence can 293 be costly and delays using the horse for its intended purpose.

294 The main limitations of this study are related to its retrospective nature, the possibility of selection 295 bias and the subjective assessment of the outcome. Many approaches have been proposed to assess 296 wound healing, varying from a simple measurement with tape or caliper to more complex methods using digital cameras or a three-dimensional measurement device.²¹⁻²³ However, these latter methods 297 are expensive and not validated for primary closure. In this study, the authors elected for a subjective 298 and very stringent method for evaluating wound dehiscence. Any gap between the wound edges was 299 300 considered a partial dehiscence and a thin dehiscence along the entire length of the wound was 301 considered a complete failure. Although this method led to difficulties in wound evaluation between observers, it was similar to the only previous published grading system used in equine wounds and 302 303 the use of such strict criteria helped to avoid bias in the evaluation and an overestimation of the success rate.³ 304

A future prospective randomized study would be the natural next step to objectively evaluate the
 Tension Tile System in comparison with other techniques. In addition, the use of an objective grading
 system based on numeric measurement should be considered for better evaluation and reproducibility.

- 308 In conclusion, the Tension Tile System provides an economical and effective alternative to traditional
- 309 or commercial tension relief systems. It helps the successful closure of challenging equine wounds
- 310 under tension in a variety of anatomical locations.

- Table 1: Observed outcome of primary closure following application of the Tension Tile System
- 312 (success or failure) for each variable.

| | | Dehiscence | | | | | |
|------------------------------------|-------|------------|----|--------------------------|----|---------------|----|
| | | None | | Partial 10-40% | | Complete >40% | |
| | | | | | | | |
| | Total | n | % | n | % | n | % |
| | 191 | 132 | 69 | 30 | 16 | 29 | 15 |
| Surgeons/surgical | | | | | | | |
| <u>centre</u> | | | | | | | |
| Dylan Gorvy<u>No. 1</u> | 155 | 110 | 71 | 20 | 13 | 25 | 16 |
| Ian Fulton <u>No. 2</u> | 9 | 8 | 89 | 1 | 11 | 0 | 0 |
| Patrick PollockNo. 3 | 27 | 14 | 52 | 9 | 33 | 4 | 15 |
| Breed | | | | | | | |
| Horse | 165 | 109 | 66 | 30 | 18 | 26 | 16 |
| Pony | 26 | 23 | 88 | 0 | 0 | 3 | 12 |
| Wound Location | | | | | | | |
| Distal limb | 51 | 34 | 67 | 8 | 16 | 9 | 18 |
| Carpus | 23 | 17 | 74 | 5 | 22 | 1 | 4 |
| Tarsus | 55 | 36 | 65 | 12 | 22 | 7 | 13 |
| Proximal limb | 44 | 33 | 75 | 2 | 5 | 9 | 20 |
| Body | 14 | 10 | 71 | 2 | 14 | 2 | 14 |
| Head/neck | 4 | 2 | 50 | 1 | 25 | 1 | 25 |
| Duration | | | | | | | |
| 0-24 hours | 92 | 62 | 67 | 16 | 17 | 14 | 15 |
| 2-7 days | 48 | 31 | 65 | 9 | 19 | 8 | 17 |

| 8-21 days | 29 | 22 | 76 | 3 | 10 | 4 | 14 |
|----------------------|-----|----|----|----|----|----|----|
| 22 days or more | 22 | 17 | 77 | 2 | 9 | 3 | 14 |
| Wound Depth | | | | | | | |
| Skin/subcutis | 82 | 53 | 65 | 16 | 20 | 13 | 16 |
| Muscle/Tendon | 55 | 38 | 69 | 8 | 15 | 9 | 16 |
| Exposed bone | 54 | 41 | 76 | 6 | 11 | 7 | 13 |
| Complicating Factors | | | | | | | |
| None | 100 | 66 | 66 | 20 | 20 | 14 | 14 |
| Open synovial cavity | 26 | 19 | 73 | 3 | 12 | 4 | 15 |
| Tendon trauma | 28 | 21 | 75 | 2 | 7 | 5 | 18 |
| Exposed bone | 37 | 25 | 68 | 5 | 14 | 7 | 19 |
| Convalescence | | | | | | | |
| 3-4 weeks | 86 | 77 | 90 | 9 | 10 | 0 | 0 |
| 5-8 weeks | 63 | 46 | 73 | 8 | 13 | 9 | 14 |
| 9-16 weeks | 31 | 6 | 19 | 11 | 35 | 14 | 45 |
| Euthanased | 11 | 3 | 27 | 2 | 18 | 6 | 55 |

| | | | Dehiscence | | | |
|----------------|----------------|-----|------------|---------|----------|--|
| | | | None | Partial | Complete | |
| | | | 0% | 10-40% | >40% | |
| Wound Location | Immobilisation | % | n | n | n | |
| Distal limb | yes | 65 | 21 | 6 | 6 | |
| | no | 35 | 13 | 2 | 3 | |
| Carpus | yes | 83 | 15 | 3 | 1 | |
| 1 | no | 17 | 2 | 2 | 0 | |
| Tarsus | yes | 73 | 28 | 8 | 4 | |
| | no | 27 | 8 | 4 | 3 | |
| Proximal limb | yes | 50 | 15 | 2 | 5 | |
| | no | 50 | 18 | 4 | 0 | |
| Body | yes | 0 | | | | |
| | no | 100 | 10 | 2 | 2 | |
| Head/neck | Yes | 0 | | | | |
| | no | 100 | 2 | 1 | 1 | |

| 324 | Table 2: Observed | outcome for | wounds with | or without | immobilisation |
|-----|-------------------|-------------|-------------|------------|----------------|
| | | | | | |

334 Figure Legends

- Fig.1: A. Materials required for the Tension Tile System (TTS); B. plastic backing of standard suture
 packs, foam dressing, and polyamide sutures (0, 1 and 2 USP)
- 337 Fig.2: A. Application of the Tension Tile System to the skin with 0 USP polyamide; B. Tension Tiles
- attached, and pre-placed horizontal mattress sutures of 2 USP polyamide inserted; C. The wound
 edges are then apposed with a combination of horizontal and simple interrupted sutures of 0 or 1 USP
- 340 polyamide.
- 341 Fig.3: A. Pre-placed USP 2 polyamide horizontal mattress sutures tied, releasing the tension on the
- suture line; B. TTS applied to a large wound on the lateral side of the distal metatarsus; C. Variation
- of the technique when the wound is located over a tendon by the USP 2 polyamide suture in a Cushingpattern.
- Fig.4: A. Large wound on the lateral side of the distal metatarsus showed with TTS figure 3B B. Thesame wound after sutures removal at 2 weeks from surgery.
- 347 Fig.S1: Comparison of the "GTA" ratchet (A) with a standard Backhaus towel clamp (B); "GTA"
- 348 applied during the application of the TTS (C)
- Fig.S2: A. Large wound over the cranial stifle B. Wound sutured with the help of the TTS C. Woundat sutures removal 2 weeks after surgery.
- 351 Fig.S3: A. Large degloving wound cranial and lateral side of the forearm B. Wound sutured with the
- help of the TTS C. Wound after sutures removal 2 weeks after surgery.
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