LiquiBand® Skin Adhesives

A compendium of clinical articles

2000-2013
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## Wound Dressing

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## Microbial Barrier

| Microbial Barrier            | 13, 14, 15   |
The use of butyl cyanoacrylate tissue adhesive (LiquiBand®) as a wound dressing following open colorectal resection and stoma formation.

Smart, N. Ghori, A.

(Department of Surgery, North Devon District Hospital, Barnstaple, UK)

• When used to dress laparotomy wounds, LiquiBand® was found to provide an effective barrier to infection, reducing the rate of observed infection compared to a control.”

Objectives: The aim of this study was to assess whether the use of a cyanoacrylate tissue adhesive would reduce the rate of surgical site infection in patients undergoing elective colorectal resection and requiring stoma formation.

Methods: 30 consecutive patients (19 male, 11 female, median age 68 years, range 44 to 86 years) requiring elective colorectal resection and either a temporary or permanent stoma were treated by one surgeon over two years (2005 – 2006). All patients received standard preoperative antibiotic prophylaxis. All laparotomy wounds following colorectal resection and stoma formation were initially closed with subcuticular undyed 3/0 vicryl and then dressed with butyl cyanoacrylate tissue adhesive (LiquiBand®, AMS (Plymouth) Ltd., UK) in a strip approximately 1cm wide along the whole length of the wound. Once the tissue adhesive had dried, the bowel was then opened to form the stoma and covered with a stoma bag.

Results: There was no statistically significant difference in distribution between the two groups in terms of the US National Nosocomial Infections Surveillance System Risk Index. Data on stoma formation in the 2003 group was unavailable. The overall surgical site infection rate in 2005/6 was 2 out of 30 patients (6.7%) compared with 5 out of 33 (15.2%) in 2003. Of the 2 patients who developed infection in the 2005/6 cohort, one was extremely high risk having type 2 diabetes, a BMI >45 kg/m2 and a prolonged operating time of greater than 4 hours. The small number of infections observed in the 2005/6 cohort and the difference in stoma formation between the two groups preclude detailed statistical analysis.

Conclusions: Cyanoacrylate based tissue adhesives used as a wound dressing have been a useful adjunct in reducing surgical site infections in patients following major colorectal resections and stoma formation.
How we do it: Tissue adhesives in osseointegrated implantation surgery

Koppana, V. Kalaiselvan, R. Snow, D.G.

(Department of ENT, Wrexham Maelor Hospital, Wrexham, UK)

- **LiquiBand®** was evaluated for securing skin grafts following hearing aid implantation and was found to be safe to use with low reported complication rates.

**Objectives:** We describe our technique and experience of using cyanoacrylate-based tissue adhesives to stabilise split thickness skin grafts following osseointegrated implantation.

**Methods:** Split thickness skin graft was replaced over the implant site and secured using N-butyl cyanoacrylate (LiquiBand®, AMS, Plymouth, UK, or similar product).

**Results:** Review at 1-week post-operatively revealed minor granulation in one (2%) procedure and no reaction in 60 (98%). Review at 12 weeks showed 58 (95%) implants in 54 (96%) patients had healed well with no problems.

**Conclusions:** Our results compare favorably to other published series using a similar technique but using suture to secure the graft.

PMID: 16759247 [PubMed - indexed for MEDLINE]
A prospective, randomized controlled trial comparing n-butyl cyanoacrylate tissue adhesive (LiquiBand®) with sutures for skin closure after laparoscopic general surgical procedures

Dowson, C.C. Gilliam, A.D. Speake, W.J. Lobo, D.N. Beckingham, I.J.

(Section of Surgery, University Hospital, Queen’s Medical Centre, Nottingham, UK)

- LiquiBand® was evaluated for topical closure of laparoscopic wounds and was found to reduce closure time, require the use of less dressings and provided comparable cosmesis and complication rates as closure by suture.

Abstract: The aim of this study was to compare the efficacy of n-butyl-cyanoacrylate tissue adhesive (LiquiBand®) with nonabsorbable monofilament sutures for laparoscopic port site closure. Adult patients having elective laparoscopic procedures were randomly allocated to wound closure with sutures or tissue adhesive. End points included skin closure time, wound dressing requirements, wound complications, and cosmesis, assessed at discharge, 4 to 6 weeks and 3 months. Seventy-eight patients randomized to receive sutures and 76 to receive tissue adhesive were eligible for final analysis. Mean closure time was significantly longer for sutures (220 vs. 125 s, P <0.001). Fewer dressings were required in the tissue adhesive group immediately postoperatively (21% vs. 97%, P <0.001) and at discharge (24% vs. 82%, P <0.001). There were no significant differences in wound complications or in cosmesis at either 4 to 6 weeks or at 3 months. Tissue adhesive for laparoscopic port site closure offers potential savings with respect to time and has comparable wound complication rates and cosmetic outcomes when compared with nonabsorbable monofilament sutures.

PMID: 16804456 [PubMed - indexed for MEDLINE]
Butylcyanoacrylate tissue adhesive for columellar incision closure

Ozturan, O. Miman, M.C. Aktas, D. Oncel, S.

(Department of Otorhinolaryngology, Inonu University, Medical Faculty, Malatya, Turkey)

- *LiquiBand*® was compared to suture for topical closure of skin incisions following rhinoplasty and was found to result in equivalent cosmesis while simplifying post-operative care.

**Abstract:** Cosmetic outcome of the columellar incision closure in external rhinoplasty patients has been a subject of discussion. This study was conducted to assess whether tissue adhesives provide an alternative option for sutureless closure of columellar skin incisions for cases utilizing open technique rhinoplastic surgery. One hundred and one patients undergoing external rhinoplasty were randomized to either topical application of butylcyanoacrylate or polypropylene sutures for columellar skin closure. The majority of tension on the wound edges was taken up using 5-0 chromic catgut. Cosmetic outcomes were evaluated by two otolaryngologists independently using visual analogue and Hollander wound evaluation scales in a blinded manner. There was no statistically significant difference in cosmesis between the surgeons’ evaluation scores for either type or repair of the columellar incision. Since the tissue adhesive forms its own protective barrier, post-operative care is simplified. Closure with adhesives eliminates the need for post-operative suture removal requiring an extra visit that should lead to more efficient use of physician and patient time. Butylcyanoacrylate performs cosmetically as well as standard suture closure of columellar skin incision used for external rhinoplasty.

PMID: 11485582  [PubMed - indexed for MEDLINE]
Wound glue: a comparative study of tissue adhesives

Charters, A.

(School of Nursing & Midwifery, University of Sheffield, Sheffield, UK)

- LiquiBand® compared to two other adhesives for topical closure of lacerations in a paediatric emergency department.
- Use of LiquiBand® resulted in lowest patient-reported pain scores compared to other adhesives and was found to be the easiest adhesive to use, providing the most consistent and effective topical wound closure.

The purpose of this study was to determine which single-use wound adhesive is the most appropriate in terms of ease of use, minimal pain on application, adequate bonding time and wound closure. The three wound adhesives audited were Indermil (n-butyl cyanoacrylate), LiquiBand® (n-butyl cyanoacrylate) and Dermabond (octylcyanoacrylate).

SAMPLE AND SETTING: The study was conducted in an urban paediatric emergency department treating over 39,000 patients annually. The sample was taken from the client population presenting with lacerations requiring tissue adhesive closure, within the limitations of the study (n = 63).

METHODOLOGY: A non-blinded comparative study was performed. Children presenting with an appropriate laceration were assigned to receive either Indermil, Dermabond or LiquiBand®. The wounds were closed following the guidelines stated by the individual manufacturers. The nurses administering the tissue adhesive were asked to complete the audit form post closure and to comment on the procedure in descriptive terms.

RESULTS: Scalp wounds accounted for 79% (n = 50) of all the lacerations closed in the study. None of the glues were reported to be completely pain-free. However, the LiquiBand® tissue adhesive produced an average pain score of only 0.1, whereas the Dermabond tissue adhesive scored the highest at 0.97. The nurses using the tissue adhesives reported that LiquiBand® was the best tissue adhesive in terms of wound closure and ease of use.

DISCUSSION AND RECOMMENDATIONS: All of the tissue adhesives examined produced satisfactory results in terms of wound closure and ease of use. However, the LiquiBand® tissue adhesive produced the most consistent results, scoring higher in most of the categories when compared with the other tissue adhesives.

PMID: 11760325 [PubMed - indexed for MEDLINE]
A Prospective Randomized Evaluation of Cyanoacrylate Glue Devices in the Closure of Surgical Wounds

Maloney, J. Kapadia, M. Rogers, G.S.

(Hematology/Oncology Care Center, Beverly Hospital, Beverly, MA & Tufts University School of Medicine, Boston, MA)

• LiquiBand® Flow Control was found to be significantly faster for topical closure of surgical incisions than Dermabond™ while providing similar high levels of cosmesis and user satisfaction.

Background: The use of medical adhesives for topical wound closure is gaining in popularity over conventional wound closure materials such as sutures and staples. Adhesives provide advantages in both wound closure and patient management with good cosmetic outcome and surgeon and patient satisfaction reported.

Objective: To compare the use of two currently marketed medical adhesives; LiquiBand® Flow Control and High Viscosity Dermabond™ for the topical closure of surgical incisions.

Methods & Materials: In a prospective blinded manner subjects were randomly assigned LiquiBand® or Dermabond™ for topical closure of a surgical incision. Variables compared included; ease of use, time taken to close wound, subject and surgeon satisfaction with device and wound closure, cosmetic outcome at 90 days and complication rates

Results: Use of both devices resulted in effective wound closure with similar high levels of cosmesis, subject and surgeon satisfaction with only minor complications reported. There was no statistically significant difference between the devices for all the parameters studied, with the exception that the LiquiBand® device was found to significantly reduce the amount of time required for closure.

Conclusion: As the two devices appear substantially equivalent in terms of key surgeon and patient variables, product cost should be the primary determinant in selection of the tissue glue device.

PMID: 23884497
A Prospective, Single-Center Study to Evaluate the Use of LiquiBand® Skin Adhesive in the Closure of Scalp Wounds

Hendry, P. Kalynych, C. Webb, K. Westenbarger, R. Lissoway, J. Kumar, V.

(University of Florida Health Science Center, Dept. of Emergency Medicine, Jacksonville, FL, USA)

- LiquiBand® was found to be safe and effective for rapid closure of simple scalp lacerations in an Emergency Department setting, with minimal pain and good to excellent cosmesis reported.

Study Objective: Dermal glues are commonly used for laceration repairs of the face but are rarely used in the US for scalp lacerations. This is the first known US study evaluating dermal glue for scalp lacerations. Study purpose was to determine effectiveness of LiquiBand® skin adhesive for scalp laceration closure.

Methods: This was a prospective, follow-up pilot study of a convenience sample. Patients aged >24 months seen in an emergency department (ED) with a scalp laceration were evaluated. Inclusion criteria were lacerations < 5cm and < 6 hours old with easily approximated edges. Evaluation on day of treatment included ease of application, patient and physician satisfaction, 10 point visual analog pain scales and wound photographs. Patients were followed-up 8-12 days post repair with physicians utilizing a modified Hollander scale for cosmesis. Four trained investigators performed all procedures and follow-up assessments.

Results: Twenty-eight patients were screened January to April 2011. Twenty met inclusion criteria with 19 completing follow-up. Age range was 2-72 years. All wounds achieved ≥ 90% apposition. There were no reports of infection and 90% (17) patients reported wound looked better or much better than expected. Pain scores were very low (M1.4; +/-2.03). All physicians rated wound as good or excellent with a mean Hollander cosmesis score of 4.6; +/- .51. Mean application and closure time was 72.5 seconds (+/- 34.92).

Conclusions: This pilot study demonstrates LiquiBand® can be used effectively for rapid closure of simple scalp lacerations with minimal pain, good to excellent cosmesis, and high physician and patient satisfaction.
Persistent wound drainage after tumor resection and endoprosthetic reconstruction of the proximal femur

Hettwer, W.H. Horstmann, P.F. Grum-Schwensen, T.A. Petersen, M.M.

(Musculoskeletal Tumor Section, Department of Orthopaedic Surgery National University Hospital, Rigshospitalet Copenhagen, Denmark)

- When used as a topical wound sealant, LiquiBand Flex® significantly reduced the duration of wound drainage, antibiotic administration and hospital stay for tumor hip arthroplasty patients compared to conventional closure using staples. The results indicate that the microbial barrier properties of LiquiBand Flex® reduce the incidence of surgical site infections following surgery.

Material and methods: To establish the duration of postoperative surgical wound drainage, duration of administration of antibiotics and the date of discharge, we performed a retrospective review of all adult patients who underwent endoprosthetic reconstruction of the proximal femur after tumor resection for primary or metastatic bone disease in our department in 2012. Prospective assessment of similar patients operated in the current year, in whom routine wound closure with staples was substituted with intradermal suture, application of Steristrips and an occlusive skin adhesive, is currently being completed.

Results: Of 42 patients operated in 2012, complete data on duration on post operative wound drainage, duration of administration of antibiotics and discharge date were available in 41. Mean duration of post operative wound drainage was 8 days (range 2 – 45), mean duration of administration of post operative antibiotics was 8.2 days (range 1 – 45) and mean hospital stay was 9.4 days (range 3 – 45). 19 patients (45%) had prolonged wound drainage (7 days or longer), prolonged hospital stay and antibiotic administration. One patient developed persistant deep periprosthetic infection with multirestistant E. coli, despite all therapeutic efforts and was discharged to palliative care with a draining sinus on post op day 45 on permanent oral antibiotics. The preliminary first 10 patients, who underwent skin closure with subcuticular suture, Steristrips and topical skin adhesive, all had dry wounds at the first scheduled post operative dressing change (mean 2.9 days, range 2 – 4), mean duration of post operative administration of antibiotics was reduced to 3.6 days (range 2 – 7) and mean hospital stay was reduced to mean 6.5 days (range 3 – 10).

Discussion: Our small sample showed a surprising prevalence of prolonged drainage from the surgical site after endoprosthetic reconstruction of the hip in tumor patients, probably reflecting multiple factors: the extent of the procedure, prolonged surgical time, often significant perioperative blood loss and the burden of primary disease with its associated comorbidities and often present recognised risk factors, such as previous radiation, chemotherapy and malnutrition, all predisposing these patients to wound healing complications. Simple change in the wound closure routine with intradermal suture, maintenance of wound apposition with Steristrips and application of a topical skin adhesive as a sealant, appears to show a promising reduction in wound drainage, post operative antibiotic administration and hospital stay and warrants further study.
2. Advanced Medical Solutions (Plymouth) Ltd. Internal Evaluation, 2012

**Microbial barrier properties of LiquiBand Flex®: an in vitro study (March, 2012)**

McAuliffe, J, Miller, G.

(Advanced Medical Solutions (Plymouth) Ltd, UK)

- *LiquiBand Flex® was found to be an effective barrier against high titre microorganism challenge.*

**Objective:** To demonstrate that LiquiBand Flex® is an effective barrier against the penetration of microorganisms.

**Methods:** A strike through test was conducted against common organisms known to cause surgical site infections (*Candida albicans, Staphylococcus aureus, Staphylococcus epidermidis, Escherichia coli, Pseudomonas aeruginosa, and MRSA*).

**Results:** Of the 600 individual test challenges, 599 LiquiBand Flex® films maintained 100% patency after 72 hours. After seven days of incubation, 99% of LiquiBand Flex® films prevented penetration of microorganisms into the agar. LiquiBand Flex® provided a 100% microbial barrier against *S. aureus, C. albicans, S. epidermidis* and MRSA for the entire duration of the challenge (7 days).

**Conclusion:** The results of this in-vitro experiment demonstrate that LiquiBand Flex® is an effective microbial barrier to high titre (10^5-10^6 cfu) challenge of gram-positive and gram-negative motile and non-motile species as well as *Candidia albicans*. These findings are in line with the CDC guidelines on preventing surgical site infections which recommend that a surgical wound be protected with a sterile dressing for 24 to 48 hours postoperatively following primary closure.
Cyanoacrylate dressings: are they microbiologically impermeable?

Rocos, B. Blom, A.W. Bowker, K.

(Bristol Implant Research Centre, Avon Orthopaedic Centre, Southmead Hospital, Bristol, UK)

- LiquiBand Flex® (formerly marketed as LiquiSeal®) demonstrated to be as effective as standard occlusive dressing as a barrier to microbial penetration.

“We elected to study the microbiological permeability of cyanoacrylate compounds, using LiquiSeal® as an example.” “This study demonstrates that, as a barrier to microbiological penetration, cyanoacrylates are as effective as standard occlusive dressings.” “…the adhesion that the cyanoacrylate compounds makes to the skin is effective in preventing the translocation of microorganisms across the skin.”

PMID: 20417580 [PubMed - indexed for MEDLINE]
Randomised trial of cyanoacrylate adhesive (‘glue’) versus absorbable sutures for skin closure following implant of permanent pacemaker.

(Addenbrooke’s Hospital, Cambridge, UK)

- LiquiBand® Surgical was evaluated for use in topical closure following pacemaker implantation and found to be significantly faster to use while providing equally good cosmetic outcome as subcuticular sutures.

Introduction: During pacemaker implantation, wound closure may be achieved with skin adhesive as an alternative to subcuticular sutures. Topical adhesive forms a strong polymeric bond across apposed wound edges. It has the advantage of shorter procedure duration, which may reduce risk of pocket infection and it has been utilised in a number of surgical procedures. However, there are no published randomised outcome data to support this approach in pacing. The purpose of this study was to compare skin adhesive with subcuticular sutures in patients receiving pacemaker implantation.

Method: In a double-blind trial, patients undergoing pacemaker implant were randomised to have skin closure with monocryl subcuticular sutures (Group 1) or cyanoacrylate skin adhesive (Group 2). Patient characteristics, wound length and duration of closure were recorded at baseline. At 12 weeks, wound healing was assessed with the 5-point modified Hollander Wound Evaluation Score (mHWES) and the 14-point Vancouver Scar Scale (VSS). Satisfaction with the cosmetic result was scored by investigator and patient with a 100mm Visual Analogue Scale (VAS). Data are shown as mean (SD).

Results: There were 35 patients in each group. There was no significant difference between Group 1 and Group 2 in patient age (77 (15) years Vs 77 (9) years, p=0.88) or wound length (37.4 (8.5)mm Vs 36.4 (7.4)mm, p=0.7). Time taken to close the wound was significantly shorter with topical adhesive (122 (44)sec Vs 296 (99) sec, p<0.0001). There was no significant difference in cosmetic outcome between the two groups: mHWES 4.4(0.9) Vs 4.0 (0.9); VSS 1.9 (1.8) Vs 2.1 (1.4), p =0.5; investigator VAS 72.5 (14.5) Vs 67.1 (14.8)mm, p=0.13; patient VAS 83.3 (10.8) Vs 83.7 (11.7)mm, p=0.78.

Conclusion: Wound closure using topical skin adhesive after permanent pacemaker implant is significantly quicker than sutures (by 3 minutes) and results in equally good cosmetic outcome.
Use of skin glue versus traditional wound closure methods in brain surgery: A prospective, randomized, controlled study

Chibbaro, S. Tacconi, L.

(Department of Neurosurgery, University Hospital Trieste, Italy)

- Use of LiquiBand® Surgical for topical skin closure following hip replacement surgery resulted in similar cosmesis, rates of complications and patient satisfaction when compared to staples.”

Traditional skin sutures (TSS) and metal skin clips (SC) are the most common devices utilized for closure of surgical incisions. They are safe and effective, although they require instruments to apply them, are time consuming and, above all, create an extra staff and cost burden for removal of sutures/staples. The ideal incision closure should be simple, effective, safe, rapid, inexpensive, painless, cosmetic and bactericidal. The present study was designed to determine the safety and efficacy of N-butyl octyl cyanoacrylate (NCA) tissue adhesive, a liquid bandage surgical product, for wound closure in brain surgery.

Our prospective randomized controlled study compared NCA with traditional methods for wound closure in brain surgery. Over a 6-month period, 40 patients who underwent a supratentorial elective craniotomy were enrolled and randomly allocated into two groups. The 20 participants in group A were treated using a new NCA tissue adhesive while the 20 participants in group B were treated using either nylon monofilament, TSS or SC. In the post-operative period and during follow-up, two different nurses (the second nurse was blinded to the closure method used) recorded details regarding wound aspects, complications and patient satisfaction using a modified version of the Hollander Wound Score Scale.

We found no difference in the cosmetic outcome of the two groups, or in wound complications rate, but the patient satisfaction score was higher in group A (9.4 vs. 7.1; p<0.005). The mean application time of the tissue adhesive was significantly faster than that of the standard suture (115s vs. 300s; p<0.001); in the skin clips subgroup it was 105s. Our study suggests that the new NCA tissue adhesive is a safe, effective and reliable skin closure for neurosurgical procedures in the supratentorial region; it also achieves optimal cosmetic results, is less time consuming to use and has greater patient satisfaction. However, further studies with a larger number of patients are necessary to corroborate these results.

PMID: 19231198 [PubMed - indexed for MEDLINE]
Skin closure after total hip replacement: a randomized controlled trial of skin adhesive versus surgical staples

Livesey, C. Wylde, V. Descamps, S. Estela, C.M. Bannister, G.C. Learmonth, I.D. Blom, A.W.
(Southmead Hospital, Bristol, UK)

Use of LiquiBand® Surgical resulted in similar cosmesis, rates of complications and patient satisfaction when compared to staples for the topical skin closure following hip replacement surgery.

Abstract: We undertook a randomized controlled trial to compare the outcomes of skin adhesive and staples for skin closure in total hip replacement. The primary outcome was the cosmetic appearance of the scar at three months using a surgeon-rated visual analogue scale. In all, 90 patients were randomized to skin closure using either skin adhesive (n = 45) or staples (n = 45). Data on demographics, surgical details, infection and oozing were collected during the in-patient stay. Further data on complications, patient satisfaction and evaluation of cosmesis were collected at three-month follow-up, and a photograph of the scar was taken. An orthopedic and a plastic surgeon independently evaluated the cosmetic appearance of the scars from the photographs. No significant difference was found between groups in the cosmetic appearance of scars at three months (p = 0.172), the occurrence of complications (p = 0.3), or patient satisfaction (p = 0.42). Staples were quicker and easier to use than skin adhesive and also less expensive. Skin adhesive and surgical staples are both effective skin closure methods in total hip replacement.

PMID: 19483223 [PubMed - indexed for MEDLINE]
A comparison between liquid surgical adhesive and skin staples for surgical wound closure: a prospective, randomised, controlled trial

Frey, C.T. Ferrao, P. Mohideen, M.

(Chris Hani Baragwanath Hospital, Johannesburg, South Africa)

- LiquiBand® Surgical found to be faster, and with greater cosmesis and patient satisfaction scores than staples for topical closure of orthopedic surgical incisions.

Abstract: We carried out a prospective randomized controlled trial comparing a cyanoacrylate (CA) tissue adhesive to skin staples. We included 80 patients who came for elective orthopedic surgery. We did not find a difference in early or late wound complications, in either group. Closure of the wound with skin staples was faster than with CA. However the cosmetic result and patient satisfaction score for the black and white skin types were higher in the CA group.
A Prospective, Randomized, Controlled, Double-Masked, Multi-Center Clinical Trial of Medical Adhesives for the Closure of Laparoscopic Incisions.

Kent, A. Liversedge, N. Dobbins, B. McWhinnie, D. Jan, H.

(Royal Surrey County Hospital NHS Foundation Trust, Guildford; Royal Devon & Exeter Hospital, Exeter; Calderdale and Huddersfield NHS Foundation Trust; Milton Keynes General Hospital, Milton Keynes)

- LiquiBand® Surgical S was found to provide high dermal apposition and cosmesis scores with low rates of dehiscence and infection following topical closure of laparoscopic incisions, while being faster and easier to use than High Viscosity Dermabond™.

Study Objective: To compare LiquiBand® Surgical S to High Viscosity Dermabond™ for the closure of laparoscopic wounds.

Design: Prospective, multicenter, randomized, controlled trial (Canadian Task Force classification I).

Setting/Participants: Multiple district Hospitals with a total of 433 subjects enrolled between 2006 and 2009 at the four investigational sites.

Interventions: In this study, LiquiBand® Surgical S (LB), an octyl/butyl cyanoacrylate blend (Advanced Medical Solutions (Plymouth) Ltd.) and High Viscosity Dermabond™ (DB), an octyl-based cyanoacrylate (Ethicon Inc.), were compared for topical skin closure of laparoscopic port sites. (www.clinicaltrials.gov; study identifier NCT00762905)

Results: High dermal apposition and cosmesis scores resulted from the use of both adhesives along with low rates of wound dehiscence and suspected infections. Masked evaluators and patients both favored Dermabond™ in the healing of the incisions (98.3% DB Vs 93.9% LB (P<0.05)) and (97.2% DB Vs 89.4% LB (P<0.05)). However, there was no difference in the overall satisfaction of the appearance of the wounds. LiquiBand® Surgical S was found to be significantly (p<0.05) faster (LB 32.1s, DB 50.3s) and easier to use than High Viscosity Dermabond™ and surgical users were significantly more satisfied with using LiquiBand® Surgical S for wound closure.

Conclusion: The results of this trial demonstrate the efficacy of LiquiBand® Surgical S for the closure of topical skin incisions while being significantly faster, easier to use and resulting in greater user satisfaction than High Viscosity Dermabond™.

PMID: 24128996 [PubMed - as supplied by publisher]
A randomized controlled trial comparing the cyanoacrylate LiquiBand® Surgical S to sutures for the closure of laparoscopic wounds

Jan, H. Waters, N. Haines, P. Kent, A.

Royal Surrey County Hospital NHS Foundation Trust, Guildford, United Kingdom

Objectives: Throughout history, various exotic materials have been used to close surgical wounds. Leather has been used as far back as 1100 BC. Cyanoacrylate adhesives offer the surgeon and patient an alternative to suturing wounds with numerous advantages including faster closure time, good cosmesis, less tissue trauma, no requirement for secondary dressing, suture/staple removal and with ease of bathing (1). Additionally, they spontaneously slough off in a short time period of time (5-10 days), thereby not requiring clinician removal (2). LiquiBand® Surgical S is a new formulation with a blend of monomeric n-butyl and 2-octyl cyanoacrylate formulation. In this study, the effectiveness, safety, and clinical utility of LiquiBand® Surgical S (LB), formerly marketed as LiquiBand® Laparoscopic, was compared to Vicryl Rapide™ for the closure of laparoscopic incisions.

Methods: This was a prospective, randomized, blinded, study of LiquiBand® Surgical S (LBSS) skin adhesive versus Vicryl Rapide™ sutures for the topical closure of laparoscopic surgical incisions. Subjects were asked to return at two weeks post surgery at which time any applicable wound complications (erythema, oedema, pain, inflammation, discharge, odor and dehiscence) were recorded along with any reported adverse events. Wounds were evaluated by a masked evaluator for apposition (<50%, 50-99% and 100%), and also for cosmesis using a modified Hollander Wound Evaluation Scale. Study subjects were asked to rate their satisfaction with their wound appearance as either satisfied or dissatisfied. Student’s t-test was used to compare variables between the two wound closure methods.

Results: A total of 114 subjects participated in this trial completing all aspects of the study. 55 subjects received sutures for topical wound closure, with 59 subjects receiving LiquiBand® Surgical. Surgeons were found to be satisfied with 100% of all applications using the LBSS device. 100% of wounds closed with sutures and 98.9% wounds closed with LBSS achieving an optimal HWES of 0. There was no statistical difference in cosmesis or complications for either method. Closure with LiquiBand® was significantly faster.

Conclusions: LiquiBand® Surgical S is as good as sutures for the closure of laparoscopic wounds in terms of cosmesis and complications whilst also being significantly faster.

Easy way of gluing the skin of surgical wounds

Durai, R. Ng. P.C.

(Department of Surgery, University Hospital Lewisham, London, UK)

- LiquiBand® Surgical S was evaluated for use in topical closure of surgical incisions and found to be easy and quick to use while providing a cosmetic outcome comparable to sutures.

BACKGROUND: Cyanoacrylate glue is commonly used for approximation of skin after various surgical procedures.

METHOD: We have written this illustrated article to educate junior doctors without any practical experience in using tissue glue.

DISCUSSION: The advantages of gluing the skin are that it is quick, saves theatre time, cheap, no stitches to remove and is waterproof. The disadvantage being it can be messy if not applied correctly.

PMID: 19570128 [PubMed - indexed for MEDLINE]
Evaluation of a new tissue adhesive for closure of laparoscopic surgical incision in day surgery

Naz, S. Ellams, J. Ray-Chaudhari, S. McWhinnie, D.

(Department of Surgery, Milton Keynes Hospital, Standing Way, Eaglestone, Milton Keynes, UK)

• *LiquiBand*® Surgical S (formerly marketed as LiquiBand Laparoscopic™) was compared to Dermabond™ for topical closure of laparoscopic wounds and found to provide good cosmesis while being easier, faster and less expensive to use.

Abstract: We compared the use of LiquiBand Laparoscopic™ (LBL) as sole closure for laparoscopic trocar wounds with our previous use of subcuticular wound sutures and Dermabond™ adhesive for skin closure in a prospective audit. LBL was easy to use and reduced the total time for wound closure from a median of 6 minutes and 24 seconds to a median of 2 minutes and 40 seconds. Wound cosmesis was good in all cases. LiquiBand Laparoscopic™ is an effective agent for the sole closure of laparoscopic wounds which also provides an occlusive barrier and good wound cosmesis. The technique was also significantly less expensive than our previously preferred wound closure method.
Liversedge, N.H.

(Royal Devon & Exeter NHS Foundation Trust, UK.)

- **LiquiBand® Surgical S and LiquiBand® Surgical** were reviewed for topical closure of small and large surgical incisions, and found to provide effective closure with good cosmetic results.

“I have found that modern cyanoacrylate adhesives and applicator systems (such as LiquiBand® Surgical S) offer me a fast, simple and effective means of surgical wound closure, especially for smaller surgical incisions. Cosmetic results are good and patients are usually delighted as the waterproof microbial barrier function means they can lightly wash or shower the area. Not having any sutures or dressings visible, or requiring follow up for removal is also a benefit. LiquiBand® Surgical offers similar benefits for use in larger wounds.”
Wound healing outcomes post laceration repair

Elden-Lee, S. Lewis, S.

(Princess Alexandra Hospital NHS Trust, Harlow, UK)

- **LiquiBand® Optima evaluated for use in an Emergency Department for the topical closure of wounds and found to provide effective wound closure, excellent cosmesis, no complications and minimal pain to patients upon application.**

“The aim of our mini research project was to ascertain whether or not our currently used skin adhesive, LiquiBand® Optima, provided both the clinician and patient with satisfactory wound healing outcomes. It also attempted to ascertain the product’s easy to use. From the eight cases presented we feel confident in the use of LiquiBand® Optima as our closure method of choice for clean, fresh and easily apposed wounds. It has provided excellent cosmesis at follow up with no incidences of dehiscence or infection. Additionally, both patient and user have reported very high levels of satisfaction with the product.”
Combined results of a multi-centre evaluation into the clinical effectiveness of LiquiBand® Optima

McAuliffe, J.
(Advanced Medical Solutions (Plymouth) Ltd, UK)

- High user and patient satisfaction reported following use of LiquiBand® Optima for wound closure in multiple emergency departments.

“This multi-centre evaluation has concluded that LiquiBand® Optima is not only easy to use but also fast therefore saving the clinician valuable time in the busy A&E setting. LiquiBand® Optima provides the clinician with a high level of control and reduced likelihood of glue spillage thereby limiting previously held safety concerns related to the use of tissue adhesives. The vast majority of patients reported pain-free application of LiquiBand® Optima during their wound closure treatment. Additionally, the vast majority of clinicians partaking in the evaluation would choose LiquiBand® Optima as their closure product of choice.”
A Clinical Evaluation of LiquiBand® Optima

Davies, B. Hunter, D.

(Royal Alexandra Hospital, Paisley, Scotland, UK)

- **LiquiBand® Optima was evaluated for use in an Emergency Department setting and found to be easy to use due to the design of the applicator, enabling controlled application of adhesive to sensitive areas such as the facial triangle.**

“From the small sample taken both practitioners and patients were found to be greatly satisfied with LiquiBand® Optima. Practitioners commented upon its ease of use and the control of delivery of the tissue adhesive. All the practitioners felt more confident when using LiquiBand® Optima especially within the facial triangle. It was observed by one individual that the viscosity of the product appeared to be less than normal LiquiBand®, but found little or no run off when using the product.”
Evaluation of a New Tissue Adhesive for Closure of Minor Cuts and Lacerations in the Accident and Emergency Department

Gammon, R.

(Princess of Wales Hospital, Bridgend, UK)

- In an Emergency Department evaluation, LiquiBand® Optima was found to be easy and quick to use for topical wound closure resulting in high user satisfaction.

Conclusion: LiquiBand® Optima proved itself to be easy to use with an extremely high satisfaction rating from the clinical user. From these results the product has been proven suitable for use in areas of medical emergency where refrigeration is not available, including all emergency room settings, ambulance services and air sea rescue teams.