

Application of Wound Dressing Molndal Technique in Clean and Potentially Contaminated Postoperative Wounds – Initial Comparative Study

Marin Marinović¹, Tedi Cicvarić¹, Nikola Gržalja¹, Giordano Bačić² and Endi Radović³

¹ Department of Traumatology, Rijeka University Hospital Center, Rijeka, Croatia

² Department of Digestive Surgery, Rijeka University Hospital Center, Rijeka, Croatia

³ Department of Physical Medicine and Rehabilitation, Rijeka University Hospital Center, Rijeka, Croatia

ABSTRACT

Because of a possible delayed wound healing, critical colonization and infection of wounds present a problem for surgeons, particularly in patients with compromised immune system or in case where the wound is heavy contaminated or poorly perfused. Molndal technique of wound dressing has proven to be effective in prevention of infection. In our study we wanted to describe the benefits of the application of Molndal technique wound dressing compared to traditional wound dressing technique at potentially contaminated and clean postoperative wounds. We examined postoperative wound after radical excision of pilonidal sinus and after implantation of partial endoprosthesis in hip fracture. Molndal technique consisted of wound dressing with Aquacel Ag – Hydrofiber. Traditional technique was performed using gauze compresses and hypoallergic adhesives. We analyzed the results of 50 patients after radical excision of pilonidal sinus. 25 patients were treated by Molndal technique and 25 patients by the traditional technique of wound dressing. In the group treated by Molndal technique only 1 (4%) patient has revealed a wound infection, proven by positive microbiological examination and suppuration. In the traditional technique group 4 (16%) patients developed wound infection as inflammation and secretion as a sign of superficial infection. In the other group we analyzed the results of 50 patients after implantation of partial endoprosthesis after hip fracture. 20 patients were treated by Molndal technique and 30 patients by the traditional technique of wound dressing. In the group treated by Molndal technique no patient has revealed a wound infection (0%). In the traditional technique group 4 (13%) patients developed wound infection. All complication in both group were superficial incisional surgical infection (according to HPSC). There was no deep incisional surgical site infection or organ / space surgical site infection. Our results are clearly showing that Molndal technique is effective in preventing the postoperative wound infection.

Key words: hip endoprosthesis, infection, Molndal, sinus pilonidalis, wound healing

Introduction

Normal intact skin is a natural barrier to microbial invasion of underlying tissue. Important factors of the skin responsible for antimicrobial properties are: low pH, low moisture levels and the presence of fatty acids¹. If the skin is breached the pathway for microbial invasion is opened¹. Because of a possible delayed wound healing, critical colonization and infection of wounds present a problem for surgeons². Colonized and infected wounds are a potential source for cross-infection¹⁻³. An infected wound can have additional disadvantages for patients including increased pain and discomfort, a delay in return

to normal activities and a possibility to life threatening illness^{5,6}. In healthcare system delayed wound healing is associated with additional costs and nursing time⁵⁻¹⁴. Molndal technique of wound dressing has proven to be effective in prevention of infection especially with addition of silver technology⁷. Also the wound heal better and faster⁷. Silver has been used medicinally for centuries. It has a proven antimicrobial effect⁸. Molndal technique usually consists of an occlusive wound dressing with a spun hydrocolloidal fibers of sodiumcarboxymethylcellulose with addition of silver⁸.



Fig. 1. Kit for Molndal wound dressing.

A gold standard for pilonidal sinus treatment is the radical excision^{9–13}. The operation wound is not clean. The wound infection after radical excision of pilonidal sinus is relatively often. Otherwise the operation wound after implantation of partial endoprosthesis in hip fracture is clean and wound infection is relatively rare^{15–18}.

Today Molndal technique is usually used in traumatology and orthopaedy, even more in digestive surgery after laparoscopic cholecystectomy¹⁹.

The aim of this study was to describe the benefits of Molndal technique of wound dressing after radical excision of pilonidal sinus and after implantation of partial endoprosthesis in hip fracture over the traditional technique.

Patients and Methods

We analyzed the results of 50 patients after radical excision of pilonidal sinus. 25 patients were treated by Molndal technique and 25 patients by the traditional technique of wound dressing. Also we analyzed the re-

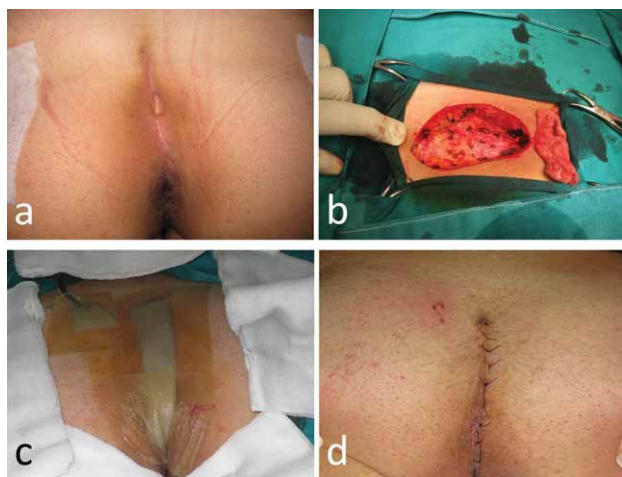


Fig. 2. Molndal technique of wound dressing after sinus pilonidalis radical excision. Sinus pilonidalis (a), situation after radical excision of sinus pilonidalis (b), Molndal wound dressing (c), situation after removal of Molndal wound dressing, no signs of infection (d).

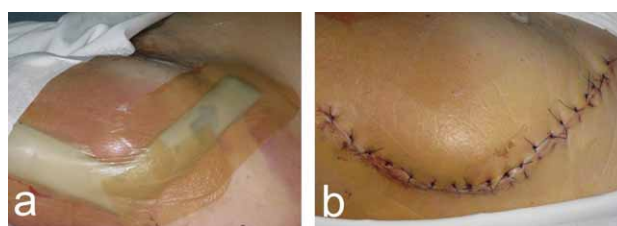


Fig. 3. Molndal technique of wound dressing after the implantation of partial hip endoprosthesis (a), situation after removal of Molndal wound dressing, no signs of infection (b).

sults of 50 patients after implantation of partial endoprosthesis after hip fracture. 20 patients were treated by Molndal technique and 30 patients by the traditional technique of wound dressing.

Moldal technique consisted of wound dressing with Aquacel Ag – Hydrofiber (ConvaTec, Dublin, Ireland) and transparent polyurethane film. Traditional technique was performed using gauze compresses and hypoallergic adhesives. To prove the colonization and infection of the wound we performed a microbiological analysis of the wound excretion and the presence of suppuration. The sample for microbiological analysis was taken immediately after surgery and 10 days after surgery when the dressing was removed. If there was clinical signs of wound infection (pain, fever, swelling) the dressing was removed earlier.

Statistical analysis

The data was elaborated and analyzed using Statistica 6.1 software package (StatSoft, Inc., Tulsa, OK, USA). For comparison standard descriptive statistic was used. A value of $p < 0.01$ was required for significance.

Results

In the pilonidal sinus group treated by Molndal technique only 1 (4%) patient has revealed a wound infection, proven by positive microbiological examination and suppuration. In the traditional technique group 4 (16%) patients developed wound infection as inflammation and secretion as a sign of superficial infection. The difference was statistically significant ($p < 0.01$). 20 patients after implantation of partial hip endoprosthesis were treated by Molndal technique and 30 patients by the traditional technique of wound dressing. In the group treated by Molndal technique no patient has revealed a wound infection (0%). In the traditional technique group 4 (13%) patients developed wound infection. The difference was statistically significant ($p < 0.01$).

All complication in both groups were superficial incisional surgical infection (according to HPSC). There was no deep incisional surgical site infection or organ / space surgical site infection.

Discussion and Conclusions

Our results are showing that in the group's treated by Molndal technique less patients had wound infection, proven by positive microbiological examination and supuration. So, in the pilonidal sinus group treated by Molndal technique only 1 (4%) patient has revealed a wound infection, proven by positive microbiological examination and supuration. In the traditional technique group 4 (16%) patients developed wound infection as inflammation and secretion as a sign of superficial infection. The difference was statistically significant ($p < 0.01$). 20 patients after implantation of partial hip endoprosthesis were treated by Molndal technique and 30 patients by the traditional technique of wound dressing. In the group treated by Molndal technique no patient has revealed a wound infection (0%). In the traditional technique group 4 (13%) patients developed wound infection. The difference was statistically significant ($p < 0.01$). Molndal technique is effective and proven to be better both in clean and unclean wounds. The results of our

study are consistent with the findings of other authors who proved that the Molndal technique of wound dressing is effective in prevention of infection especially with addition of silver technology⁷. Also the wound heal better and faster⁷. The traditional technique of wound dressing is associated with significantly higher rate of wound infections and delayed healing with increased pain and discomfort, a delay in return to normal activities and a possibility to life threatening illness^{5,6}. In healthcare system delayed wound healing is associated with additional costs and nursing time^{5,6}. In our opinion this is especially applicable for the dressing of both clean and unclean surgical wounds. The low infection rate of wounds treated by Molndal technique assured to almost all patients faster recovery earlier release and no additional costs and nursing time^{15–18}.

Based on the results of this study our recommendation is to use Molndal technique in dressing surgical wounds after radical excision of pilonidal sinus and after implantation of partial hip endoprosthesis.

REFERENCES

1. PARSONS D, BOWLER PG, MYLES V, JONES S, Wounds, 17 (2005) 222. — 2. BOWLEER PG, DELARGY H, PRINCE D, FONDBERG L, Wounds, 5 (1993) 1. — 3. WHITE RJ, COOPER R, KINGSLEY A, Br J Nurs, 10 (2001) 563. — 4. BOWLER PG, Ostomy Wound Manage, 49 (2003) 2. — 5. LANSDOWN AB, J Wound Care, 11 (2002) 125. — 6. LEAPER DJ, Int Wound J, 3 (2006) 282. — 7. NADWORNÝ PL, BURRELL RE, Journal of Wound Technology, 2 (2008) 6. — 8. LINDHAL S, RONNERHAG M, Eurostoma, 26 (2008) 9. — 9. GOLUBOVIC S, GOLUBOVIC V, CINDRIC-STANCIN M, TOKMADZIC VS, Coll Antropol, 33 (2009) 299. — 10. MAHFAZAH AM, DARADKEH SS, Saudi Med J, 30 (2009) 1044. — 11. ULUDAG M, YETKIN G, CITGEZ B, JSLS, 13 (2009) 337. — 12. ABUZAKUK T, COWARD P, SHENAVA Y, KUMAR VS, SKINNERJA, Int Wound J, 3 (2006) 133. — 13. PULANIC D, RUDAN I, Coll Antropol, 29 (2005) 341. — 14. GLAVIC Z, BEGIC L, BAGARIC I, SABALIC S, SIMUNOVIC M, GOTOVAC M, Coll Antropol, 31 (2007) 203. — 15. JULIAN FG, RUIZ FJ, Curr Med Res Opin, 21 (2005) 281. — 16. HARLE S, KORHONEN A, KETTUNEN J, SEITSALO S, J Orthop Nurs, 9 (2005) 205. — 17. CICVARIC T, BENCEVIC-STRIEHL H, JURJETIC I, MARINOVIC M, GRZALJA N, OSTRIC M, Coll Antropol, 34 (2010) 199. — 18. SMRKE D, BISCEVIC M, SMRKE B, ZUPAN B, Coll Antropol, 34 (2010) 931. — 19. MARINOVIC M, CICVARIC T, JURJETIC I, GRZALJA N, MEDVED I, AHEL J, Coll Antropol, 34 (2010) 243.

M. Marinović

Department of Traumatology, Rijeka University Hospital Center, T. Stržića 3, 51000 Rijeka, Croatia
e-mail: marin.marinovic@inet.hr

PRIMJENA MÖLNDAL TEHNIKA PREVOJA U ČISTIM I POTENCIJALNO KONTAMINIRANIM POSLIJEOPERACIJSKIM RANAMA – POČETNA KOMPARATIVNA STUDIJA

SAŽETAK

Zbog mogućeg odloženog cjeljivanja rane, kritična kolonizacija i infekcija rane predstavljaju problem za kirurga, osobito u bolesnika s oslabljenim imunološkim sustavom. Mölndal tehnika prevoja rane pokazala se učinkovitom u prevenciji infekcije. U našem istraživanju željeli smo opisati prednosti primjene Mölndal tehnike prevoja rane u usporedbi s tradicionalnom tehnikom u potencijalno kontaminiranih i čistih poslijeoperacijskih rana. Ispitali smo cijeljenje rane nakon radikalne ekscizije pilonidalnog sinusa i nakon implantacije djelomične endoproteze u bolesnika s prijelomom kuka. Mölndal tehnika sastojala se od prevoja s Aquacel Ag – Hydrofiber. Tradicionalna tehnika provedena je pomoću gaze i hipoalergijskog ljepljiva. Analizirali smo rezultate 50 pacijenata nakon radikalne ekscizije pilonidalnog sinusa. 25 bolesnika liječeno je Mölndal tehnikom, a 25 bolesnika tradicionalnom tehnikom prevoja rane. U skupini liječenoj Mölndal tehnikom u samo 1 (4%) bolesnika pojavila se infekcija rane, što je dokazano pozitivnim mikrobiološkim brisom i supuracijom. U skupini previjanoj tradicionalnom tehnikom 4 (16%) bolesnika su razvila infekciju rana. U drugoj skupini analizirali smo rezultate 50 pacijenata nakon implantacije djelomične endoproteze nakon

prijeloma kuka. 20 bolesnika liječeno je Mólndal tehnikom, a 30 bolesnika tradicionalnim načinom. U skupini liječenoj Mólndal tehnikom niti jedan pacijent nije imao infekciju rane (0%). U skupini liječenoj tradicionalnom tehnikom 4 (13%) pacijenta su razvila infekciju rane. Naši rezultati jasno pokazuju kako je Mólndal tehnika učinkovita u sprečavanju poslijeoperacijskih infekcija rana.