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# Application of Wound Closure Molndal Technique after Laparoscopic Cholecystectomy – Initial Comparative Study

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## ABSTRACT

*Because of a possible delayed wound healing, critical colonization and infection of wounds present a problem for surgeons<sup>1–3</sup>. Colonized and infected wounds are a potential source for cross-infection<sup>1–3</sup>. Molndal technique of wound dressing has proven to be effective in prevention of infection. Also the wound heal better and faster<sup>3–5</sup>. In our study we wanted to describe the benefits of the Molndal technique wound dressing after laparoscopic cholecistectomy compared to traditional wound dressing technique. Molndal technique consisted of wound dressing with Aquacel Ag – Hydrofiber (ConvaTec, Dublin, Ireland). Traditional technique was performed using gauze compresses and hypoallergic adhesives. We analyzed the results of 100 patients after laparoscopic cholecystectomy. 50 patients were treated by Molndal technique and 50 patients by the traditional technique of wound dressing. In the group treated by Molndal technique only 1 (2%) patient has revealed a wound infection, proven by positive microbiological examination and suppuration, mostly in the subumbilical incision. In the traditional technique group 7 (14%) patients developed wound infection also predominantly in the subumbilical incision. The difference was statistically significant ( $p < 0.01$ ). Our results are clearly showing that Molndal technique is effective in preventing the infection of subumbilical incision wound and is to be recommended for regular use at designated site after laparoscopic cholecistectomy.*

**Key words:** infection, laparoscopy, 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 acids<sup>1</sup>. If the skin is breached the pathway for microbial invasion is opened<sup>1</sup>. Because of a possible delayed wound healing, critical colonization and infection of wounds present a problem for surgeons<sup>2</sup>. Colonized and infected wounds are a potential source for cross-infection<sup>1–3</sup>. 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<sup>5,6</sup>. In healthcare system delayed wound healing is associated with additional costs and nursing time<sup>5–14</sup>. Molndal technique of wound dressing has proven to be

effective in prevention of infection especially with addition of silver technology<sup>7</sup>. Also the wound heal better and faster<sup>7</sup>. Silver has been used medicinally for centuries. It has a proven antimicrobial effect<sup>8</sup>. Molndal technique usually consists of a occlusive wound dressing with a spun hydrocolloidal fibers of sodiumcarboxymethylcellulose with addition of silver<sup>8</sup>.

A gold standard for cholecistectomy today is laparoscopy<sup>9–13</sup>. The wound infection after laparoscopic cholecistectomy is relatively rare and occurs mostly in the subumbilical incision<sup>12</sup>.

The aim of this study was to describe the benefits of Molndal technique of wound dressing after laparoscopic cholecistectomy over the traditional technique.

## Patients and Methods

We analyzed the results of 100 patients after laparoscopic cholecystectomy. 50 patients were treated by Molndal technique and 50 patients by the traditional technique of wound dressing.

Molndal 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. For all tested subjects the first sample for microbiological analysis was sterile. 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.



Fig. 1 Kit for Molndal wound dressing.



Fig. 2. Molndal technique wound dressing after laparoscopic cholecystectomy.



Fig. 3. Wounds after the removal of Molndal wound dressing. No signs of infection.

## Results

We analyzed the results of 100 patients after laparoscopic cholecystectomy. 50 patients were treated by Molndal technique and 50 patients by the traditional technique of wound dressing. In the group treated by Molndal technique only 1 (2%) patient has revealed a wound infection, proven by positive microbiological examination and suppuration, mostly in the subumbilical incision. In the traditional technique group 7 (14%) patients developed wound infection also predominantly in the subumbilical incision. The difference was statistically significant ( $p < 0.01$ ).

## Discussion and Conclusions

Our results are showing that in the group treated by Molndal technique only 1 (2%) patient has revealed wound infection, proven by positive microbiological examination and suppuration, mostly in the subumbilical incision. In the traditional technique group 7 (14%) patients developed wound infection also predominantly in the subumbilical incision. The difference was statistically significant ( $p < 0.01$ ). 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 technology<sup>7</sup>. Also the wound heal better and faster<sup>7</sup>. The traditional technique of wound dressing is associated with significantly bigger 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<sup>5,6</sup>. In healthcare system delayed wound healing is associated with additional costs and nursing time<sup>5,6</sup>. In our opinion this is especially applicable for the dressing of the subumbilical incision after laparoscopic cholecystectomy. The low infection rate of the subumbilical incision treated by Molndal technique assured to almost all patients faster recovery earlier release and no additional costs and nursing time.

Based on the results of this study our recommendation is to use Molndal technique in dressing the su-

bumbilical incision wound after laparoscopic cholecistectomy.

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## PRIMJENA MOLNDAL TEHNIKE PREVIJANJA RANE NAKON LAPAROSKOPSKE HOLECISTEKTOMIJE – POČETNA KOMPARATIVNA STUDIJA

### SAŽETAK

Zbog mogućeg odloženog cijeljenja kirurške rane, kolonizacija i infekcija predstavljaju problem za kirurga<sup>1-3</sup>. Kolonizirane i inficirane rane su mogući razlog ukriženih infekcija<sup>1-3</sup>. Molndal tehnika previjanja rane dokazano je učinkovita u prevenciji infekcije rane. Rana cijeli brže i bolje<sup>3-5</sup>. U našoj studiji željeli smo pokazati prednosti Molndal tehnike nakon laparoskopske holecistektomije u odnosu na tradicionalni prevoj rane. Molndal tehnika sastoji se od aplikacije Aquacel Ag – Hydrofiber (ConvaTec, Dublin, Ireland) podloge na ranu. Tradicionalna tehnika prevoja sastoji se od uporabe gaze i hipoalergijskog flastera. Analizirali smo rezultate u 100 bolesnika nakon laparoskopske holecistektomije. 50 bolesnika tretirano je Molndal tehnikom, a 50 bolesnika tradicionalnom tehnikom prevoja rane. U grupi bolesnika tretiranim Molndal tehnikom svega je 1 (2%) bolesnik razvio infekciju rane, dokazanu pozitivnim brisom i supuracijom. U grupi tretiranoj tradicionalnom tehnikom 7 (14%) bolesnika razvilo je infekciju rane i to uglavnom u subumbilikalnom području. Razlika između dvije grupe statistički je značajna ( $p < 0.01$ ). Naši rezultati jasno pokazuju kako je Molndal tehnika učinkovita u prevenciji infekcije subumbilikalne incizije. Stoga je preporučljiva njena uporaba u svakodnevnoj praksi nakon laparoskopske holecistektomije.