



Surgical Site Infection Surveillance in Trans-Umbilical Single-Incision Laparoscopic Cholecystectomy

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Background

- ✓ Single-incision laparoscopic cholecystectomy (SILS-C) has cosmetic advantages compared with multi-port laparoscopic cholecystectomy.
- ✓ SILS-C requires a trans-umbilical approach. Surgeons are often concerned regarding the development of surgical site infection (SSI).
- ✓ However, the incidence of SSI in SILS-C remains unclear.

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Aim

To clarify the incidence and risk factors of SSI in SILS-C.

Method

We evaluated 100 cases of patients who underwent trans-umbilical SILS-C.

The cases which are...

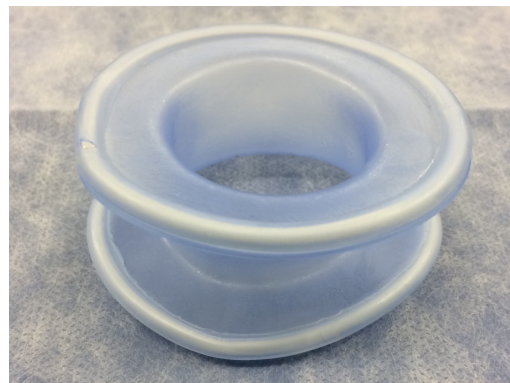
- ✓ converted to multi-port surgery
- ✓ converted to open surgery

are not included.

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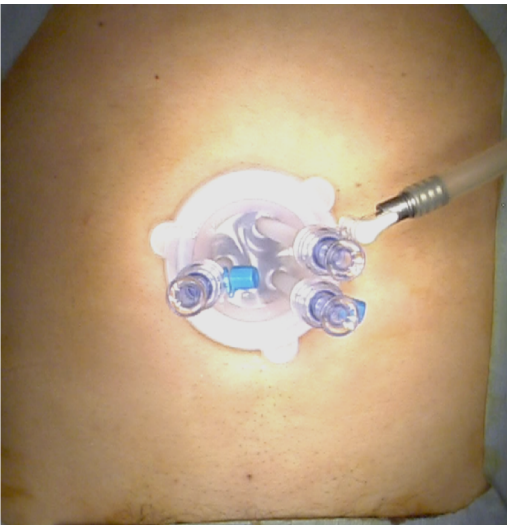
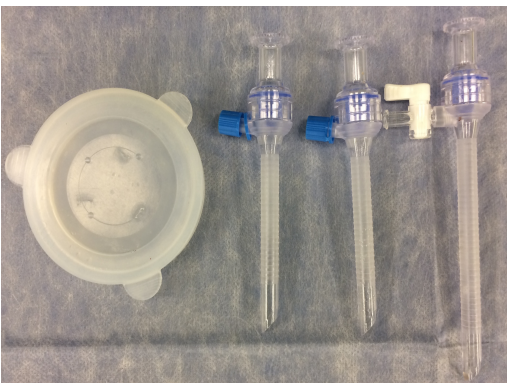
Equipment for SILS-C

LAPPROTECTOR™ (Hakko, Japan)



LAPPROTECTOR™ is placed on the umbilical wound as a wound protector.

EZ access®, EZ trocar® (Hakko, Japan)

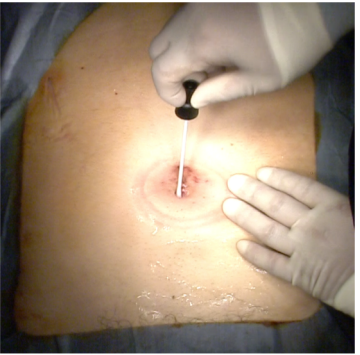


Three EZ trocars® are inserted into the EZ access®, and then attached to the LAPPROTECTOR™.

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Step of wound closure

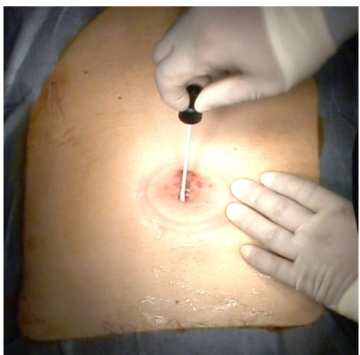
Before skin closure, bacteria examination is performed as pre-irrigation phase.



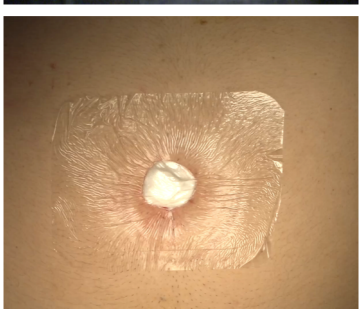
The wound is irrigated with 1L warm saline.



Subsequently, bacteria examination is performed as post-irrigation phase.



After skin closure, the wound is covered with a cotton ball, and is draped with transparent film dressing.
This dressing is removed at POD2.



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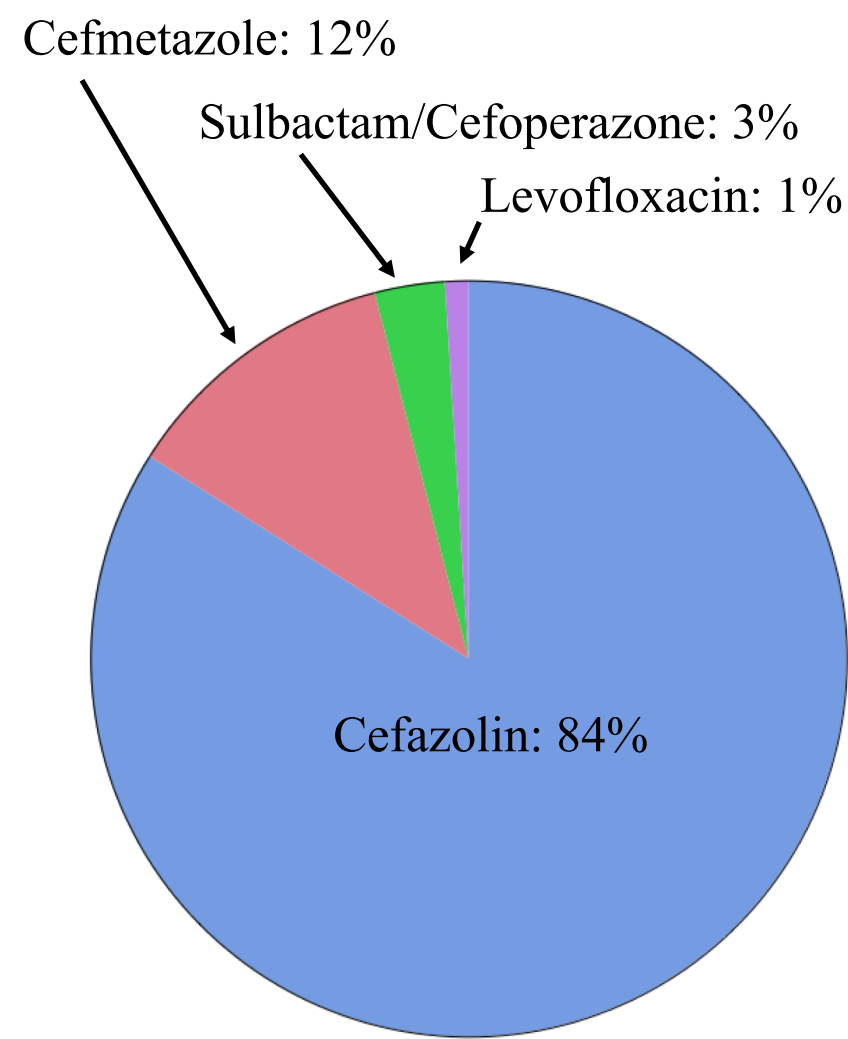
Characteristics (n=100)

Age (y, mean ± SD)	64.1 ± 14.0
Gender (Male/Female)	42/58
BMI (kg/m2, mean ± SD)	23.7 ± 3.8
ASA score (1/2/3)	25/73/2
Smoking (yes, %)	39%
Diabetes (yes, %)	12%
Op. time (min, mean ± SD)	109.1 ± 33.1
Blood loss (ml, mean ± SD)	9.5 ± 24.7
Spillage of a bile juice during surgery (yes, %)	14%
Placement of drain (yes, %)	1%
Hospital stay (d, mean ± SD)	6.3 ± 2.4

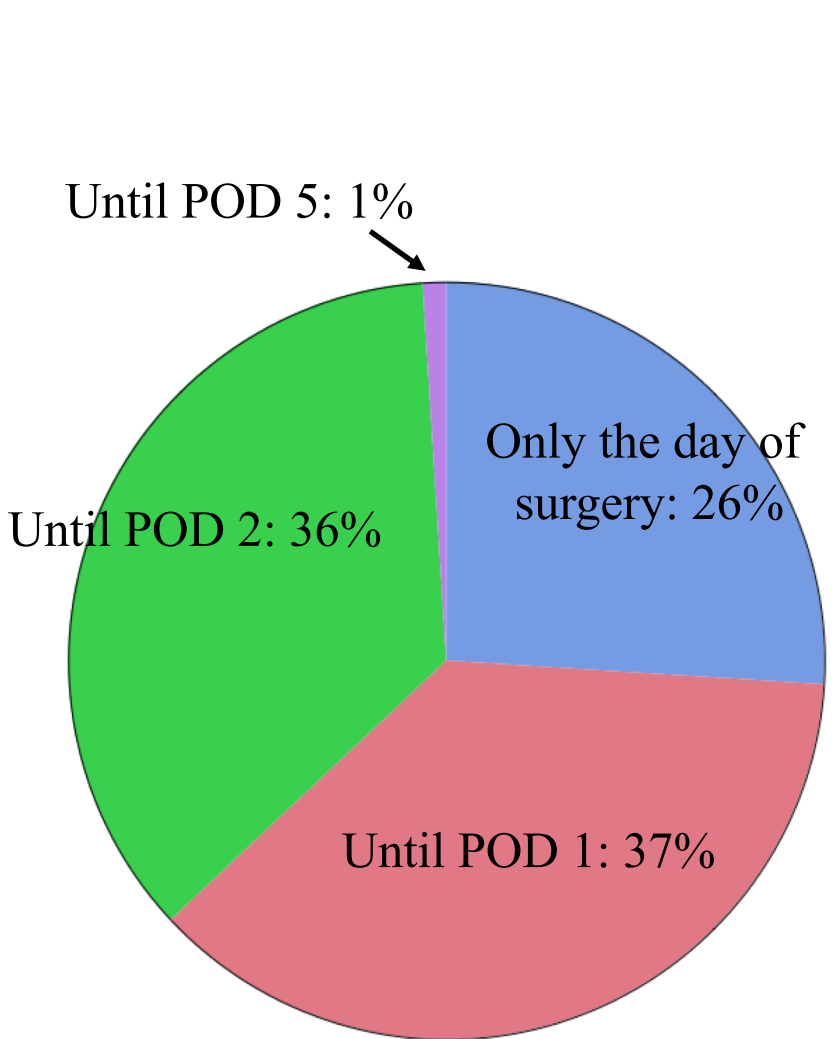
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Use of antibiotics

Type



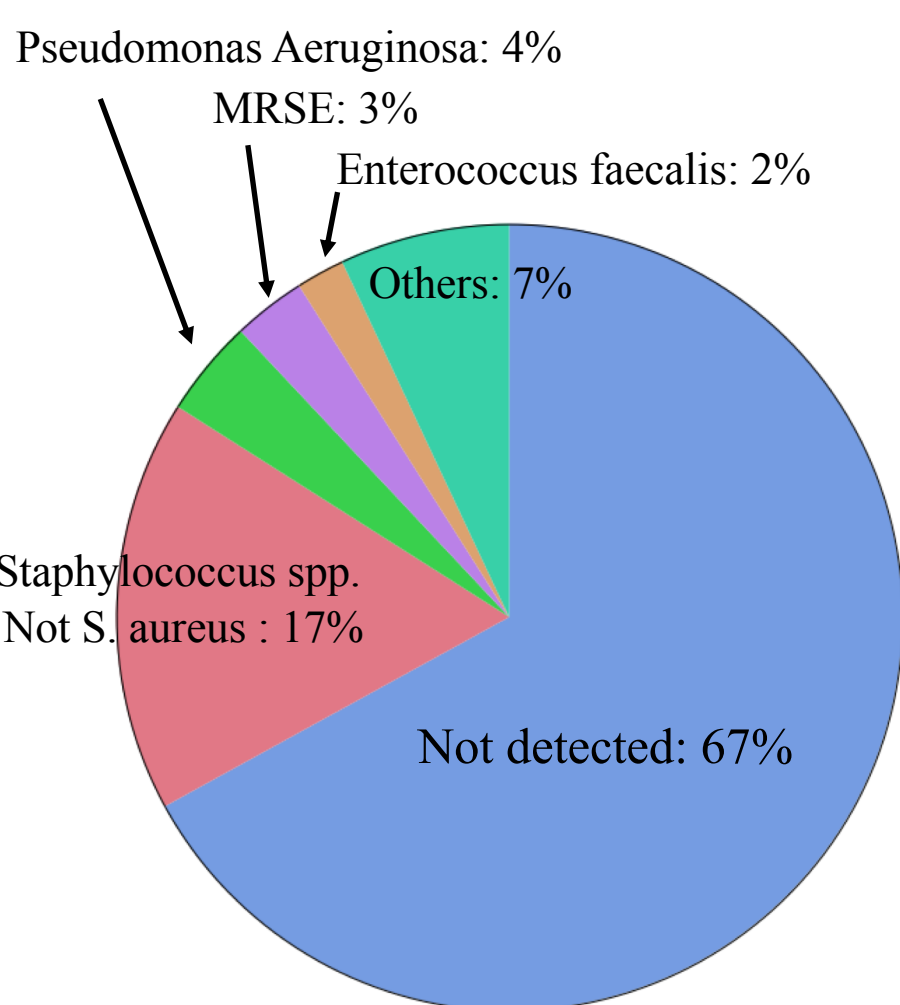
Administration period



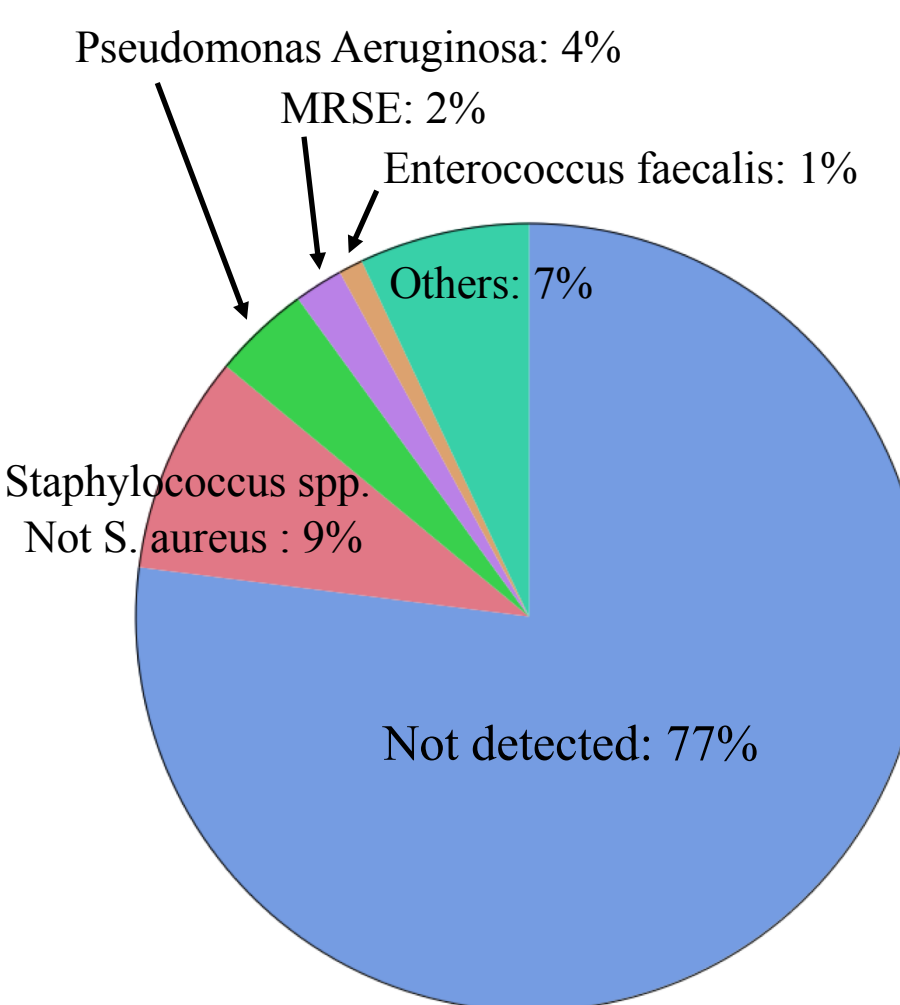
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Cultured bacteria

Pre-irrigation



Post-irrigation



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Details of SSI cases (n=3/100; 3%)

Case	Age	Gender	BMI (kg/m2)	Op. time (min)	Blood loss (ml)	Cultured bacteria		
						Pre-irrigation	Post-irrigation	SSI wound
1	20	Female	15.9	133	0	Staphylococcus spp.	Not detected	MRSA
2	80	Female	28.4	100	1	Staphylococcus spp.	Not detected	Pseudomonas Aeruginosa
3	62	Female	20.9	225	15	Pseudomonas Aeruginosa	Pseudomonas Aeruginosa	Pseudomonas Aeruginosa

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Comparison between SSI cases and non-SSI cases

Variables	SSI cases (n=3)	Non-SSI cases (n=97)	P value
Age (y, mean ± SD)	54.0 ± 8.1	64.4 ± 1.4	0.20
Gender (Male/Female)	0/3	42/55	0.26
BMI (kg/m2, mean ± SD)	21.7 ± 6.3	23.8 ± 3.7	0.36
ASA score (1/2/3)	1/2/0	24/71/2	0.92
Smoking (yes, %)	33%	39.2%	1.00
Diabetes (yes, %)	0%	12.4%	1.00
Op. time (min, mean ± SD)	152.7 ± 18.7	107.7 ± 3.3	0.02
Blood loss (ml, mean ± SD)	5.3 ± 8.3	9.7 ± 25.0	0.77
Spillage of a bile juice during surgery (yes, %)	33.3%	13.4%	0.37
			0.80
Placement of drain (yes, %)	0%	1%	1.00
Administration period of antibiotics (d, mean ± SD)	2.3 ± 0.6	2.1 ± 0.8	0.67
Detection of bacteria at			
Pre-irrigation (yes, %)	100%	30.9%	0.03
Post-irrigation (yes, %)	33.3%	22.68%	0.55
Hospital stay (d, mean ± SD)	13.0 ± 6.6	6.1 ± 1.8	<0.01

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Risk factors of SSI

Variables	Univariate	Multivariate	
	P value	Odd ratio (95%CI)	P value
Age	0.22		
Gender (Female)	0.07	9.96e+8 (0.54 - not calculated)	0.11
BMI	0.34		
ASA score	0.94		
Smoking	0.84		
Diabetes	0.38		
Op. time	0.04	1.02 (0.99 - 1.06)	0.23
Blood loss	0.70		
Spillage of a bile juice	0.39		
Placement of drain	0.80		
Administration period of antibiotics	0.67		
Detection of bacteria at			
Pre-irrigation	<0.01	1.60e+9 (1.11 - not calculated)	0.04
Post-irrigation	0.68		

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Summary

- ✓ The incidence of SSI in trans-umbilical SILS-C was 3%.
- ✓ Detection of bacteria at the pre-irrigation phase examination was the risk factor of SSI.
- ✓ However, the bacteria detected at the pre-irrigation and/or post-irrigation were not always the causative bacteria.
- ✓ Even if the bacteria were detected at the post-irrigation phase examination (23% in this study), SSI did not always occur.

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Conclusion

- ✓ The incidence of SSI in trans-umbilical SILS-C was 3%.
- ✓ The risk factor of SSI was a detection of bacteria at the pre-irrigation phase examination.

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