

Temporary abdominal closure (TAC) in open abdomen therapy with Negative Pressure Wound Therapy (NPWT): High exudate handling

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INTRODUCTION:

Negative Pressure Wound Therapy (NPWT) for temporary abdominal closure (TAC), plus damage control surgery (DCS) has shown good results in the management of abdominal compartment syndrome^{1,2,3}. However, fascial closure problems remain unsolved. In our clinic, we combine NPWT with the application of continuous tension to the abdominal wall fascia to prevent fascial retraction, making complete closure of the abdominal wall possible. Five cases showing exceptional high exudate handling from an NPWT system^ are highlighted. The cases were from a single-center descriptive, prospective, non-controlled, ethics approved clinical investigation.

METHODS

An open abdomen (OA) NPWT dressing* and device^ for TAC were used in our open abdomen cases which included patients undergoing DCS and patients at risk of compartment syndrome. The study was conducted under good clinical practice (GCP) standards and proven by our federal ethics committee. After positioning the fenestrated organ contact layer, a precut black PU foam was placed and covered with transparent film (NPWT -80 mmHg). Observed parameters included wound exudate volume handling, length of stay in the intensive care unit, duration of the entire treatment, and if fascial closure could be achieved.

RESULTS

The goal of therapy (TAC and fascial closure) was achieved in all five patients. An unexpected short recovery time of 2 days TAC treatment until fascial closure was noted in 5/5 cases. Our results also show exceptional real-time handling of high exudate volumes averaging 500ml of abdominal wound exudate per day (Table 1). Stagnation and pooling of exudate were not observed.

CONCLUSIONS

All 5 open abdomen cases managed with the NPWT system^ to prevent fascial retraction show results that have exceeded expectations, especially in removing high volumes of exudate.

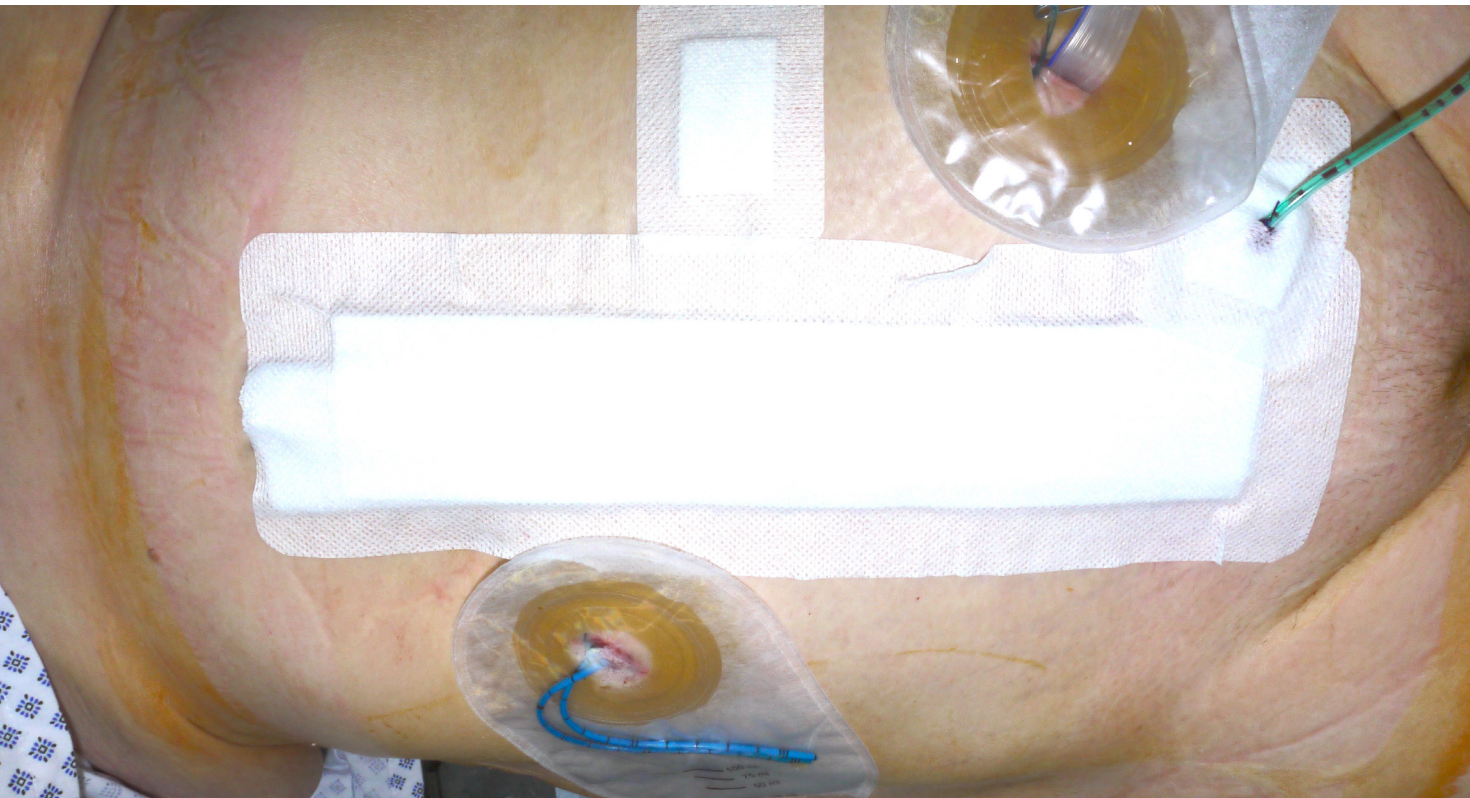
In conclusion, clinical observation fully supports independent lab data comparing the performance of different NPWT systems⁴. Our clinical data correlates that the NPWT system^ utilized meets the standard of care⁵ and exceeds the standard with superior fluid handling performance in real-time⁴ with no observed exudate stagnation or pooling.

TABLE 1 Summary of the case outcomes, with special highlights to the high exudate volume collected by the NPWT dressing* and device^ utilized

Patient	Sex	Age [y]	ASA	BMI	TACs	Abdominal Closure	SSI	Fascial Closure	Days Until Closure	Suction [mmHg]	Drainage Pod 1	Drainage Pod 2	Drainage Sum	Pump Problems
0	f	65	3	23.7	1	yes	no	yes	2	-80	600	300	900	none
1	m	44	3	19.6	1	yes	no	yes	2	-80	300	200	500	none
2	f	79	4	27.8	1	yes	no	yes	2	-40	800	700	1500	none
3	f	42	4	27.8	1	yes	no	yes	2	-40	400	300	700	none
4	f	71	3	23.9	1	yes	A1	yes	2	-80	700	400	1100	none
mean/median	1m: 4f	60,2	3	24.56	1	100%	20%	100%	2	40-80	560	380	940	none



71 yr old ♀ , urothelial carcinoma recurrence, anastomotic leakage, underwent resection of the carcinoma from the neobladder. DCS, relaparotomy, open abdomen with NPWT closure



4th OR procedure, peritoneal lavage, suture of anastomosis and complete abdominal closure (10 days post open abdomen NPWT)



Patient with NPWT dressing* and device^

*Invia®Abdominal Dressing Kit;
^Invia® Liberty™ NPWT System

References:

1. Coccolini et al. World Journal of Emergency Surgery (2018) 13:7 DOI 10.1186/s13017-018-0167-4

2. Töns, C., Schachtrupp, A., Rau, M. et al. Abdominelles Kompartmentsyndrom: Vermeidung und Behandlung. Chirurg 71, 918–926 (2000). <https://doi.org/10.1007/s001040051156>

3. Sohn M, Iesalnieks I, Agha A, Steiner P, Hochrein A, Pratschke J, Ritschl P, Aigner F. Perforated Diverticulitis with Generalized Peritonitis: Low Stoma Rate Using a "Damage Control Strategy". World J Surg. 2018 Oct;42(10):3189-3195. doi: 10.1007/s00268-018-4585-y. PMID: 29541823

4. Paglinawan R, Schwab P, Bechert K. Negative pressure wound therapy system Innovates standard of care via intelligent pressure control and dynamic exudate removal. Wounds. 2020;32(10):S1-S8.

5. Apelqvist J, Willy C, Fagerdahl AM, et al. EWMA document: negative pressure wound therapy – overview, challenges and perspectives. J Wound Care. 2017;26(Suppl 3):S1–S113.

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