

床の硬さにおいて、実験モデルにおける調査  
を裏付ける結果であった。また、著者の開発  
した装具は、臨床の場でも容易に圧を計測で  
きるため、植皮片に加わっている圧を客観的  
に判断し、過圧迫も予防しうる方法と考えら  
れ、また、今後、植皮の生着過程を調査して  
いくうえでも有用な手段になりうると思われ  
る。



ま と め

タイオーバー作成後の圧の経時的変化に影響する因子を調査するため、圧測定装置を開発した。実験においては、実験モデルとして、スポンジ、鳥肉、各種の縫合材料やドレッシング材料などを用いて調査した。結果としては、特にタイオーバー材料の乾湿や、湿る時期、移植床の硬さや移植床周囲の可動性、縫合糸の種類などが影響を与えていることが示唆された。

また、臨床における調査においては、経時的変化の経過の違いにより3種類の型に分類した。このうち1型と、2型の半数にあたる78%では、術後48時間以内に圧の低下が認められ、タイオーバーは、植皮片の生着に対し、合目的的に作用すると考えられた。しかし、移植床直下に骨や硬い瘢痕などの組織が存在する2型や、3型の場合は、圧が低下しにくく、圧迫壊死に注意が必要と考えられた。これら臨床調査の結果は実験調査を裏付ける結



果と考 え ら れ ら れ た。

以 上 の 所 見 よ り、 臨 床 の 場 に お い て も そ れ  
ら の 要 素 を 十 分 に ふ ま え て タ イ オ ー バ ー を 作  
成 す べ き と 考 え ら れ、 ま た、 開 発 し た 圧 測 定  
装 置 の 有 用 性 を 確 認 し た。



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Table 1 Condition of each groups

Group no.	Recipient	Kinds of material	Volume of material (grams)	dry or not	Kinds of suture	Mobility*
A	sponge	Cotton	8	dry	Silk	
B	sponge	Gauze	8	dry	Silk	
C	sponge	Surgical sponge	8	dry	Silk	
D	sponge	Cotton	16	dry	Silk	
E	sponge	Cotton	8	dry	Nylon	
F	sponge	Cotton	8	Gradually soaked	Silk	
G	sponge	Cotton	8	Initially soaked	Silk	
H	sponge + iron plate	Cotton	8	dry	Silk	
I	Meat	Cotton	8	dry	Silk	Poor
J	Meat	Cotton	8	dry	Silk	Good

\* means mobility of the surrounding tissue of the grafted skin



Table 2 Sites of tie-over dressings

Recipient site	Pattern 1	Pattern 2	Pattern 3	total
forehead, scalp	1	3	2(2**)	6
cheek	0	2(2*)	0	2
lip	1	1	1(1***)	3
neck	7	2	0	9
arm	1	0	0	1
chest	5	4(3*)	0	9
abdomen	4	0	0	4
back	6	0	1(1*)	7
buttock	1	0	0	1
thigh	4	0	0	4
poplitea	2	2(2***)	0	4
Total	32	14	4	50

host bed: \* bone under host bed

\*\* periosteum

\*\*\* scar



Table 3 Pressure immediately after tie-over dressing

Pressure(mmHg)	0~9	10~19	20~29	30~39	40~49	50~
Pattern 1	4	6	6	12	4	0
Pattern 2	0	0	4	3(2*)	4(2*,1***)	3(1*,1***)
Pattern 3	0	1(1*)	1(1***)	2(2**)	0	0
total(%)	4(8)	7(14)	11(22)	17(34)	8(16)	3(6)

host bed: \* bone under host bed

\*\* periosteum

\*\*\* scar



Table 4 The relationship between sites and initial pressure

No.	Pressure (mmHg)	Site	Pattern	No.	Pressure (mmHg)	Site	Pattern
1	5	abdomen	1	26	35	neck	1
2	5	back	1	27	35	neck	1
3	7	chest	1	28	39	thigh	1
4	8	chest	1	29	45	neck	1
5	10	arm	1	30	46	back	1
6	14	abdomen	1	31	47	abdomen	1
7	17	thigh	1	32	49	chest	1
8	18	chest	1	33	20	chest	2
9	18	lip	1	34	24	head	2
10	19	chest	1	35	25	neck	2
11	20	thigh	1	36	26	neck	2
12	20	back	1	37	34	lip	2
13	23	abdomen	1	38	36	chest	2*
14	23	head	1	39	38	cheek	2*
15	25	bottom	1	40	40	cheek	2*
16	28	neck	1	41	42	chest	2*
17	30	thigh	1	42	44	poplitea	2***
18	30	poplitea	1	43	45	head	2
19	30	back	1	44	50	chest	2*
20	30	poplitea	1	45	54	poplitea	2***
21	31	neck	1	46	59	head	2
22	31	back	1	47	18	back	3*
23	31	neck	1	48	24	lip	3***
24	34	neck	1	49	30	forehead	3**
25	34	back	1	50	38	head	3**

host bed: \* bone under host bed

\*\* periosteum

\*\*\* scar



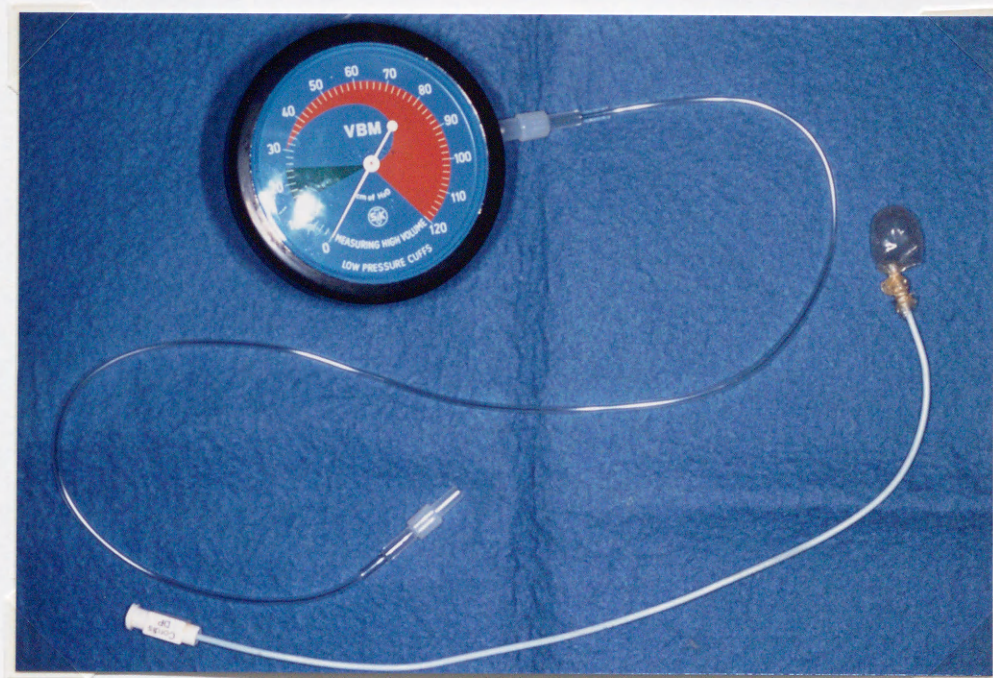


Fig. 1 The catheter is connected with a cuff inflator and a rubber balloon.



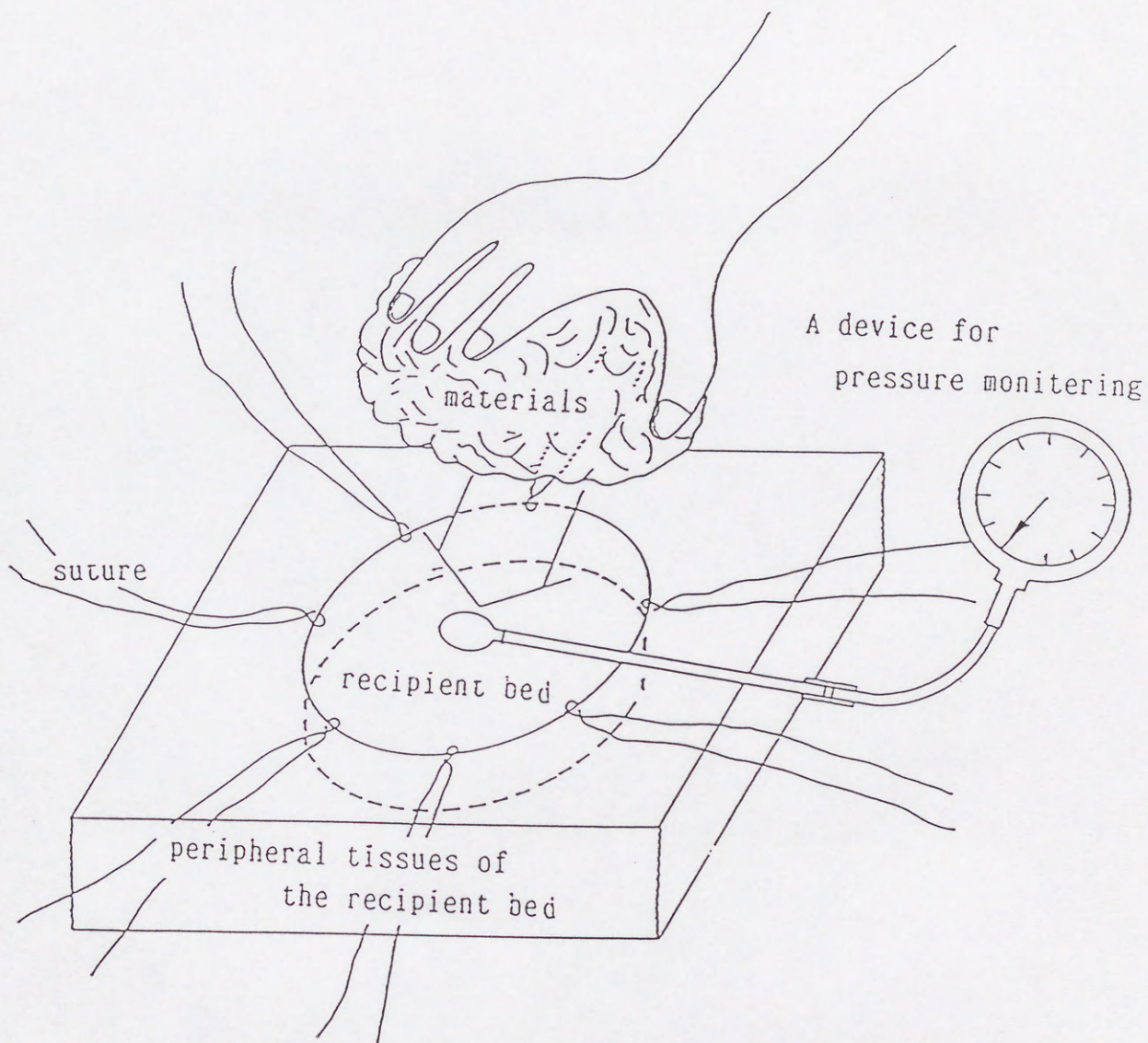


Fig. 2 Models of the experiments were on the Reston sponge or a piece of chicken meat.



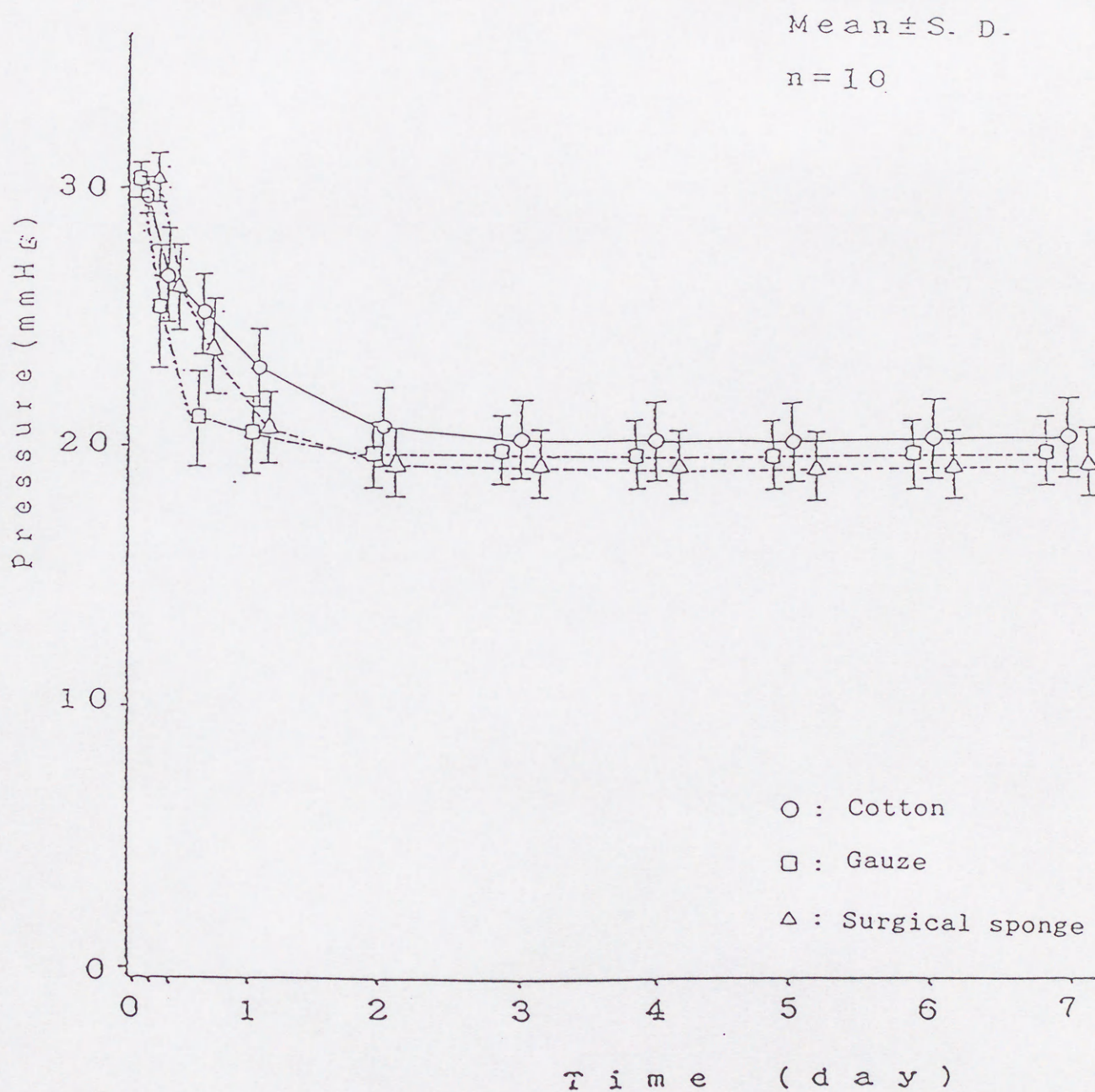


Fig. 3 Comparison of pressure in the tie-over dressings made with cotton, gauze, and surgical sponge (Group A, B, and C).



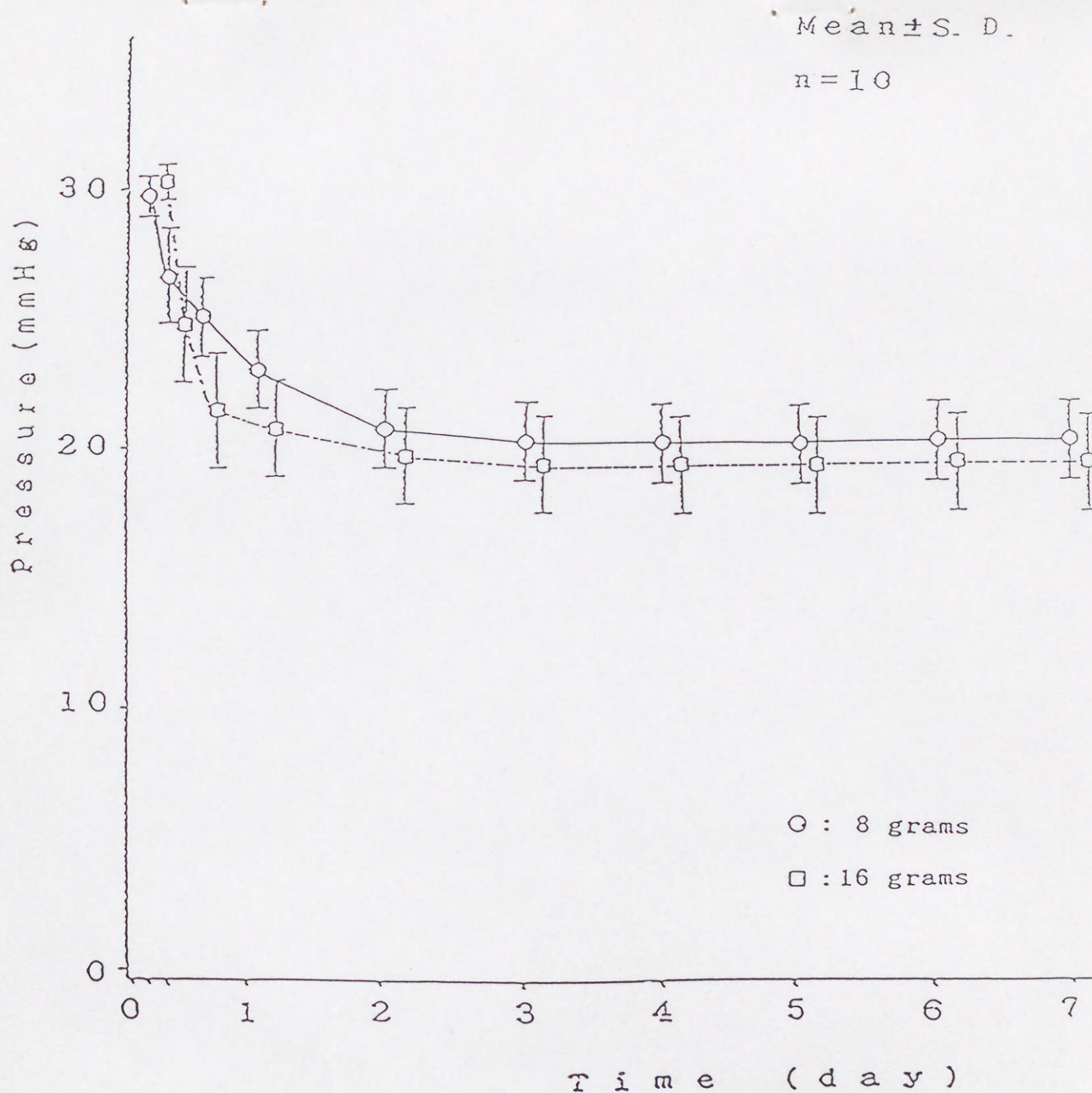


Fig. 4 Comparison of pressure in the tie-over dressings made with cotton weighting 8 grams and 16 grams cotton (Group A and D).



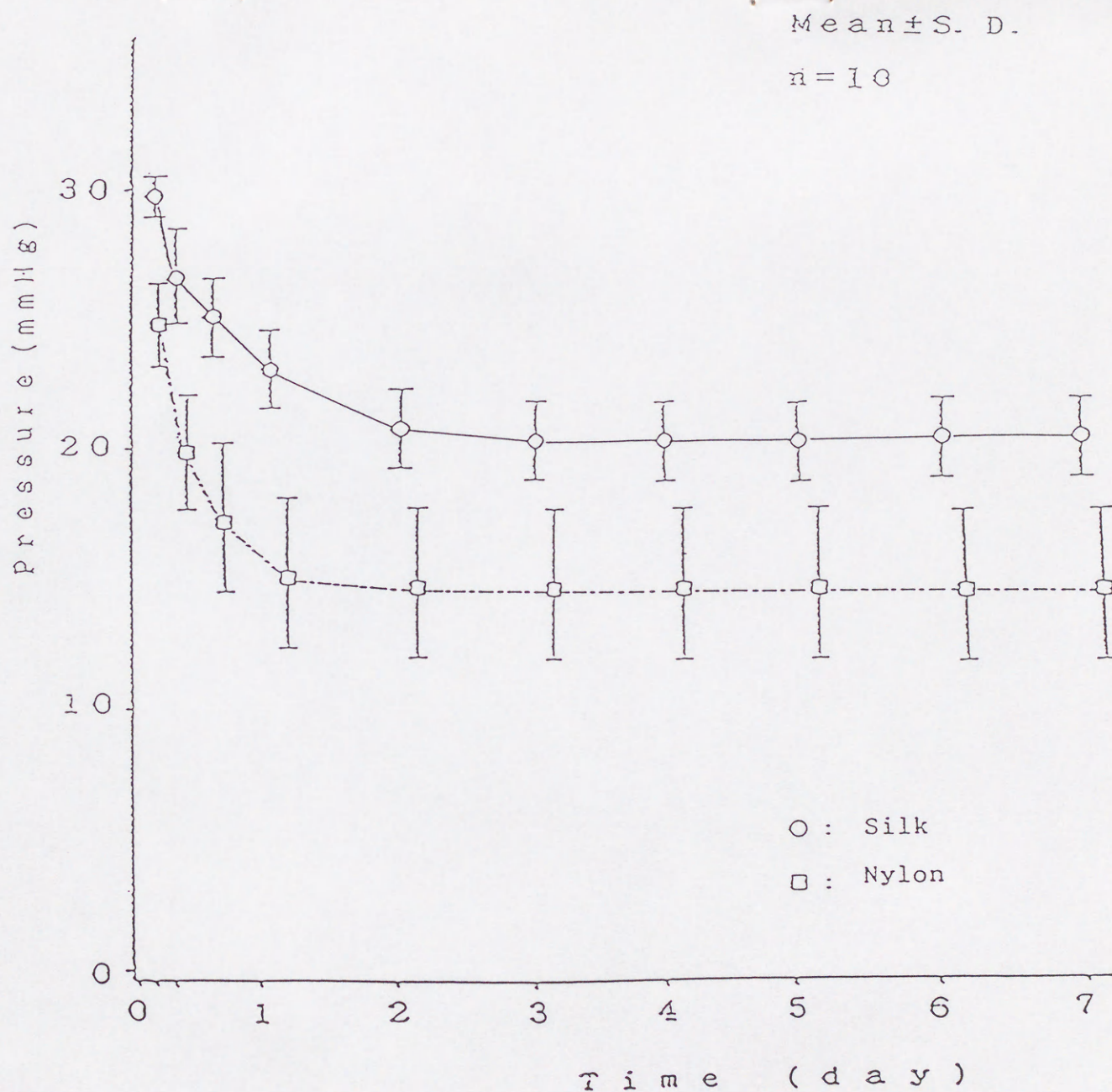


Fig. 5 Comparison of pressure in the tie-over dressings made with silk and nylon (Group A and E).

Initial pressure :  $p < 0.01$



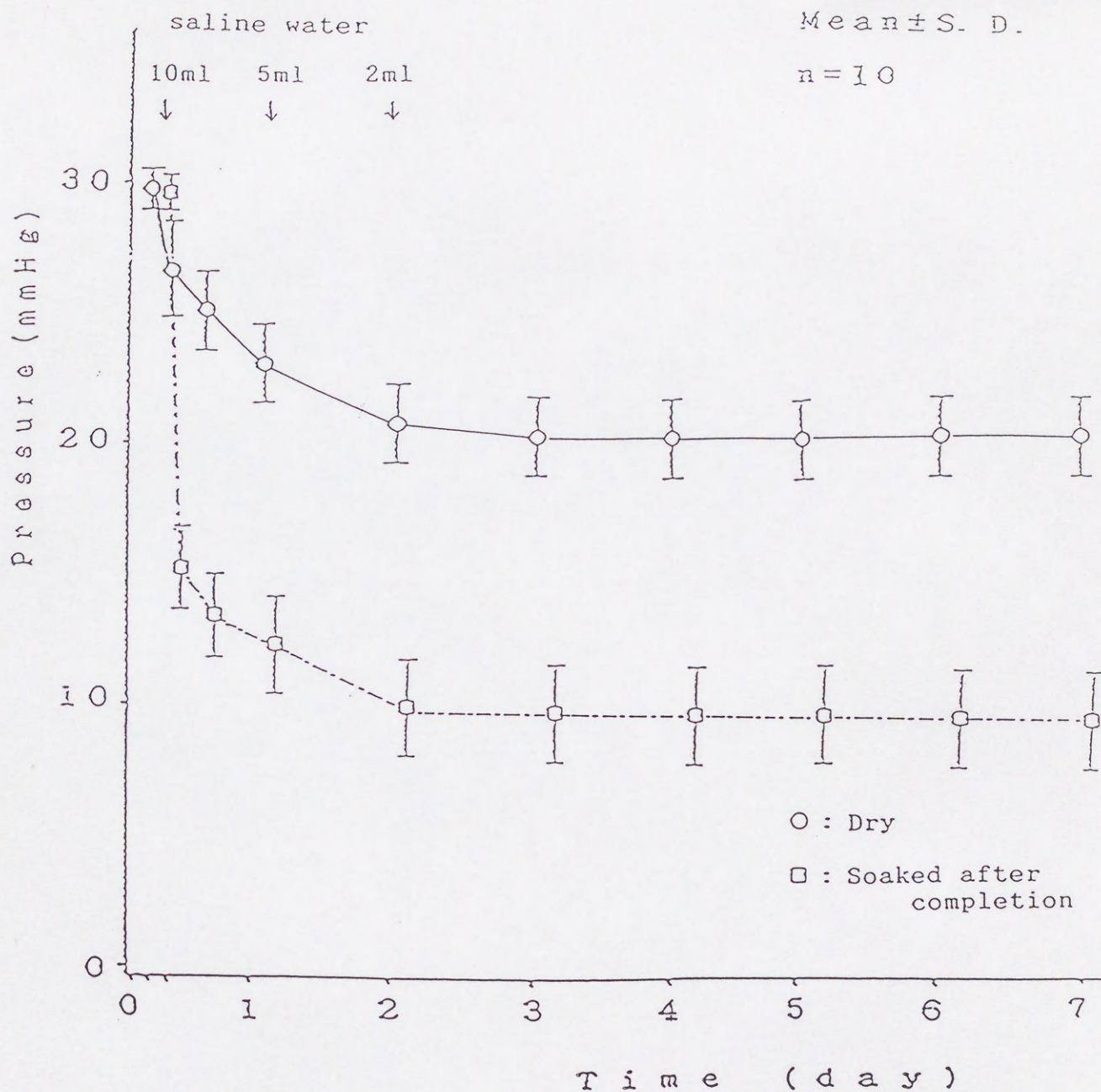


Fig. 6 a) Comparison of pressure in tie-over dressings soaked after completion and those not soaked (Group A and F).

Decreased pressure with time :  $p < 0.05$



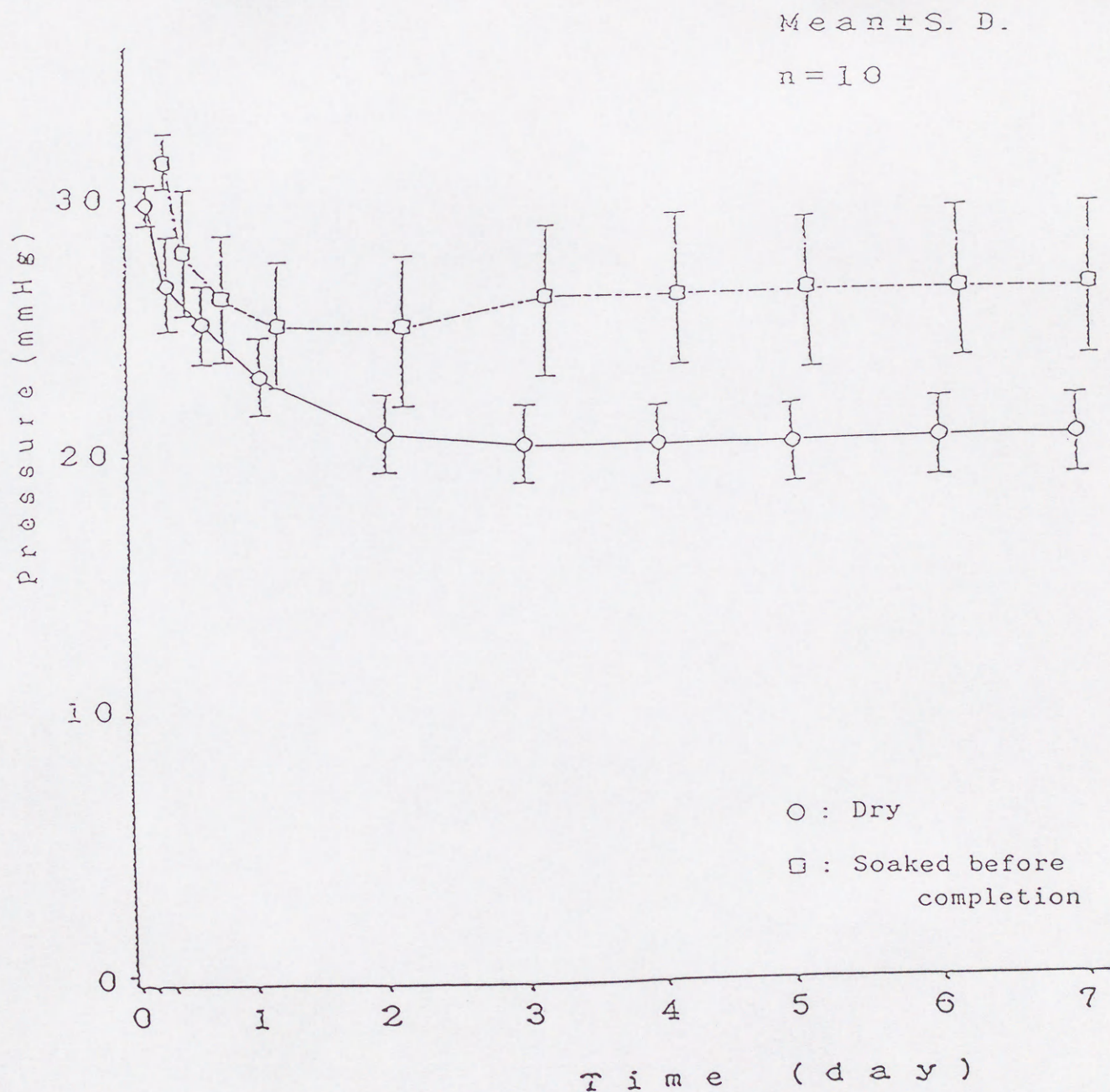


Fig. 6 b) Comparison of pressure in the tie-over dressings made with wet and dry absorbent materials (Group A and G).

Initial pressure :  $p < 0.01$

Decreased pressure with time :  $p < 0.05$



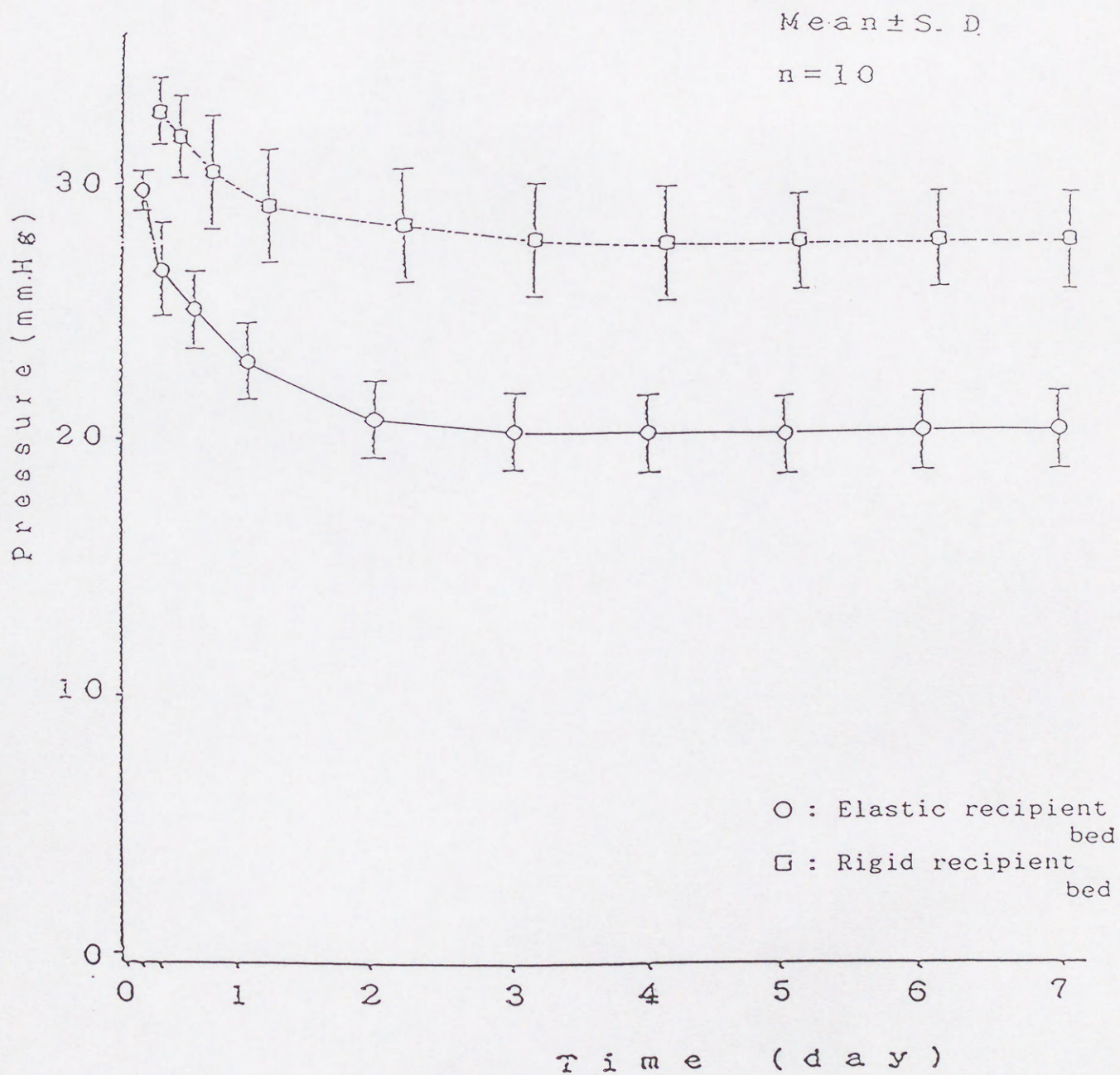


Fig. 7 Comparison of pressure in the tie-over dressings on an elastic and rigid recipient bed (Group A and H).

Initial pressure :  $p < 0.01$

Decreased pressure with time :  $p < 0.05$



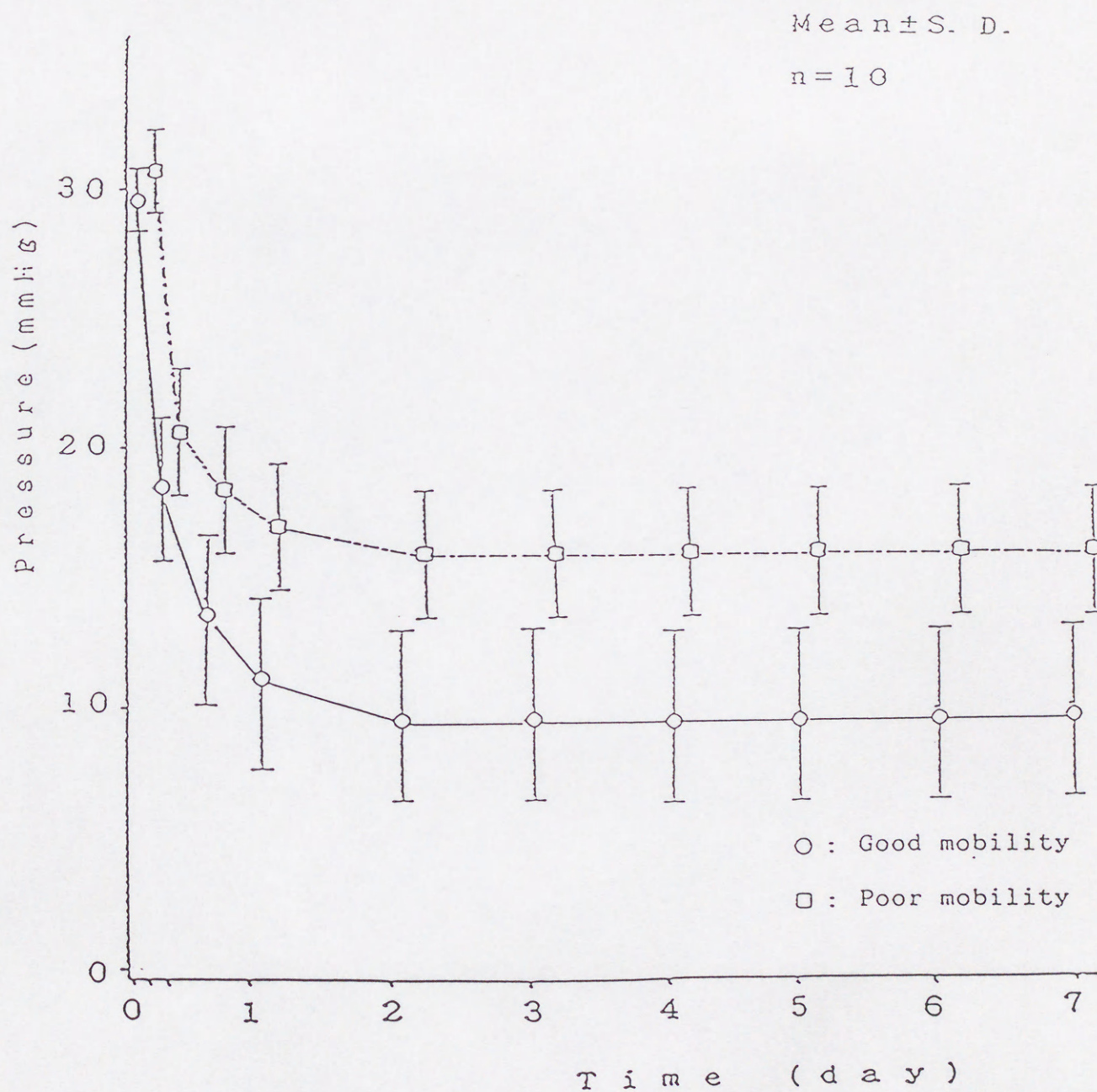


Fig. 8 Comparison of pressure in the tie-over dressings on a recipient bed whose peripheral tissues have poor mobility and good mobility (Group I and J).

Decreased pressure with time :  $p < 0.05$



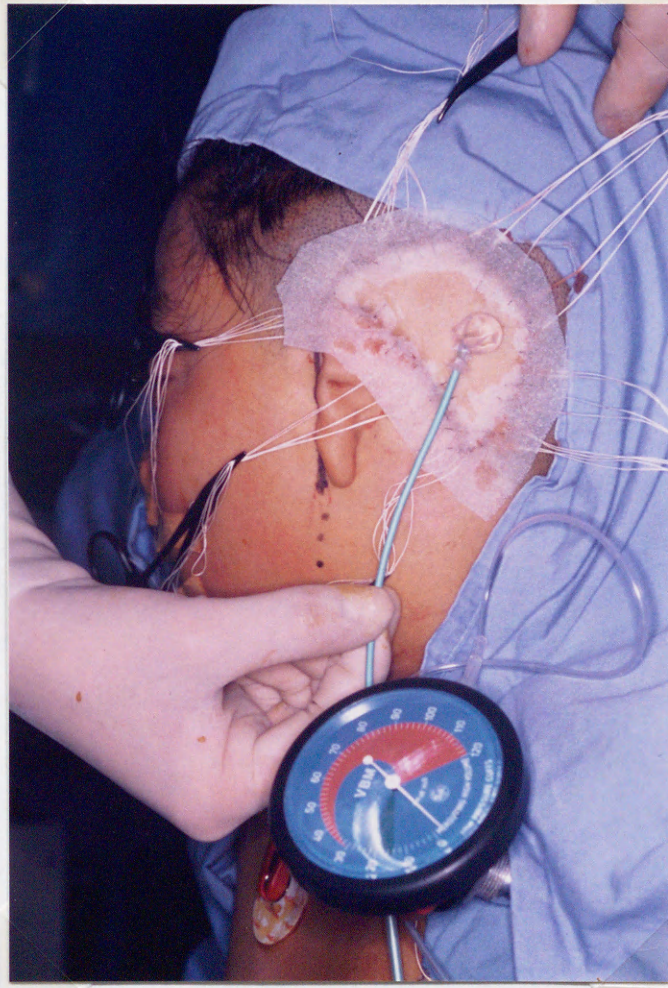


Fig. 9 a) The balloon is placed at the center of the grafted skin.





Fig. 9 b) then tie-over dressing is applied using fluffed gauze.



Pattern 1

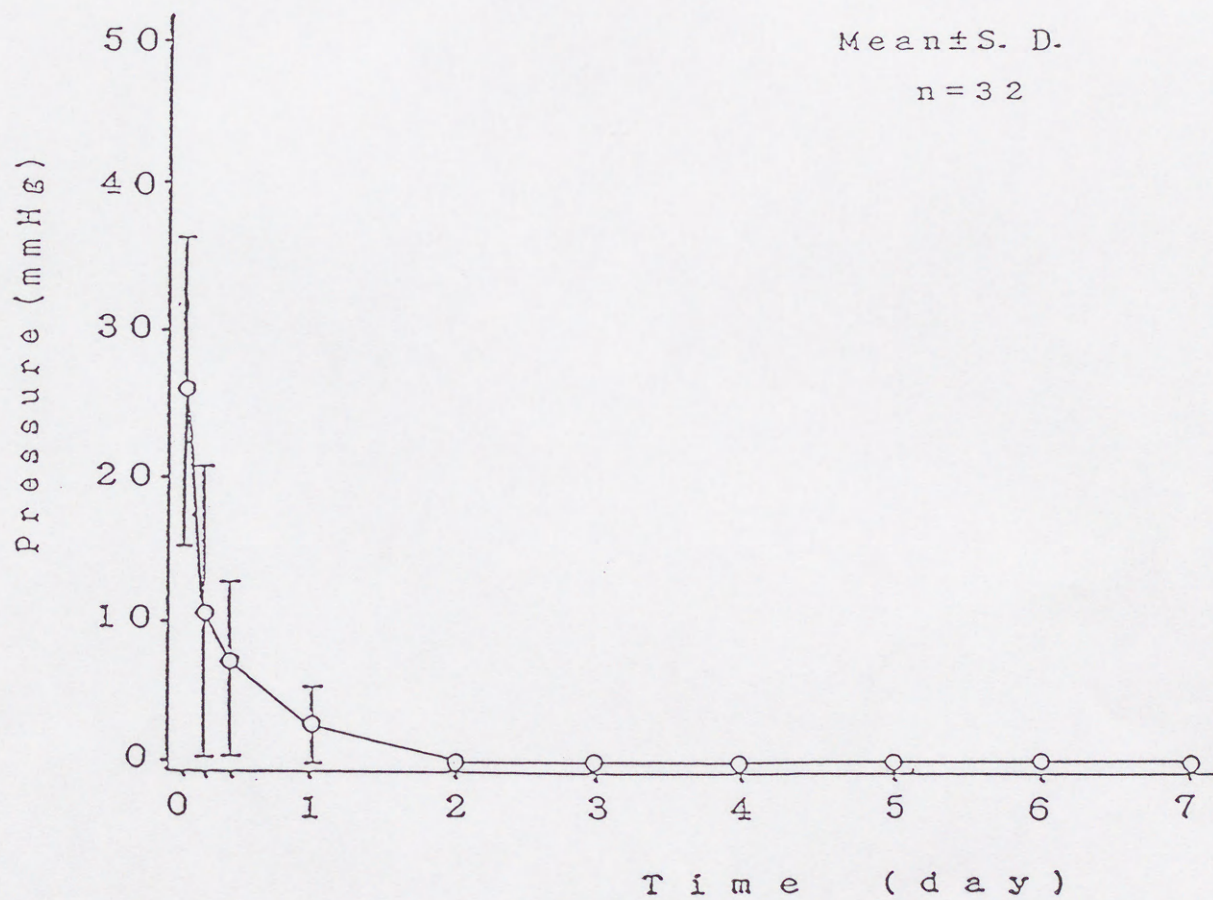


Fig. 10 Pattern 1 : Grafts lost all pressure in 1  
or 2 days after surgery.



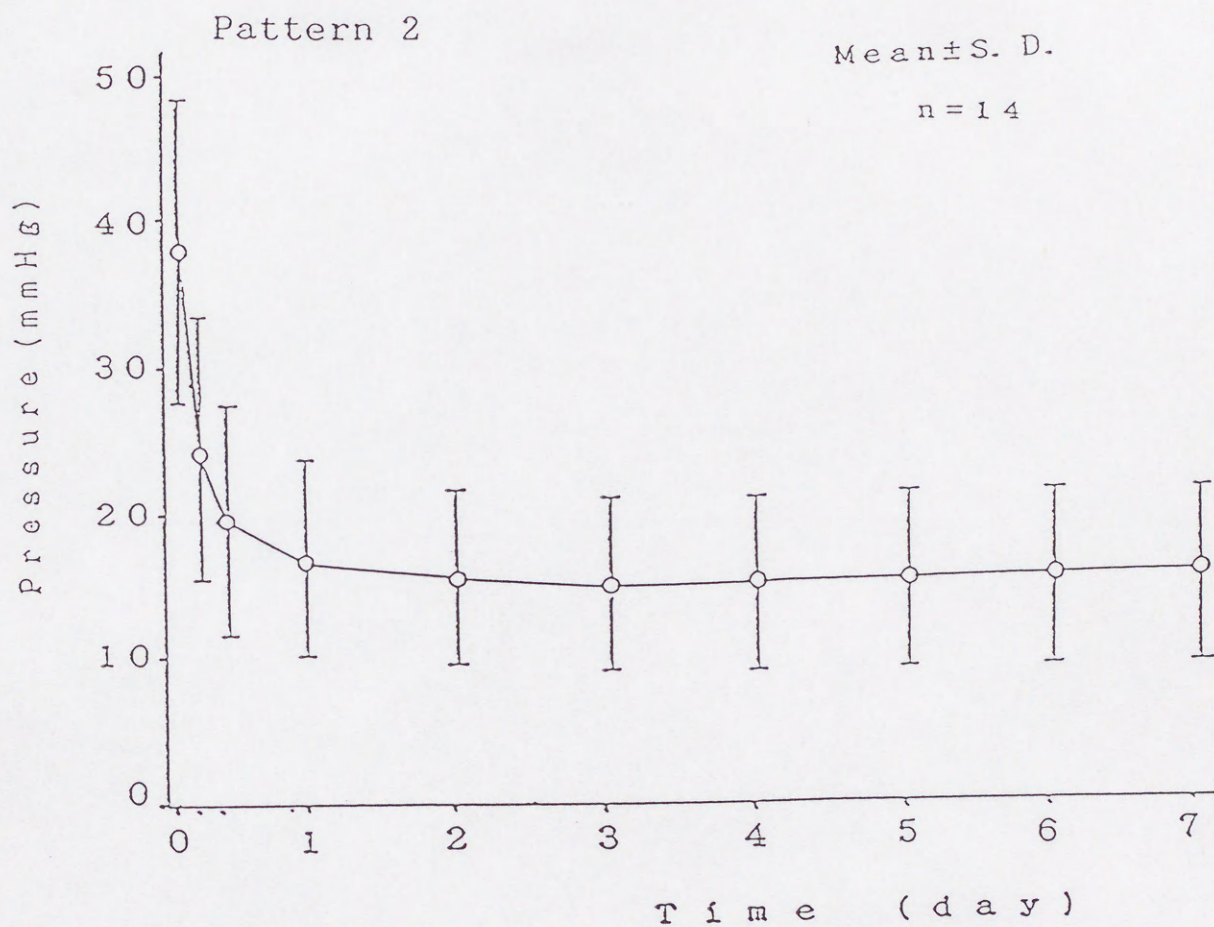


Fig. 11 Pattern 2 : Pressure decreased soon after surgery but some pressure continued until the tie-over dressing was removed.



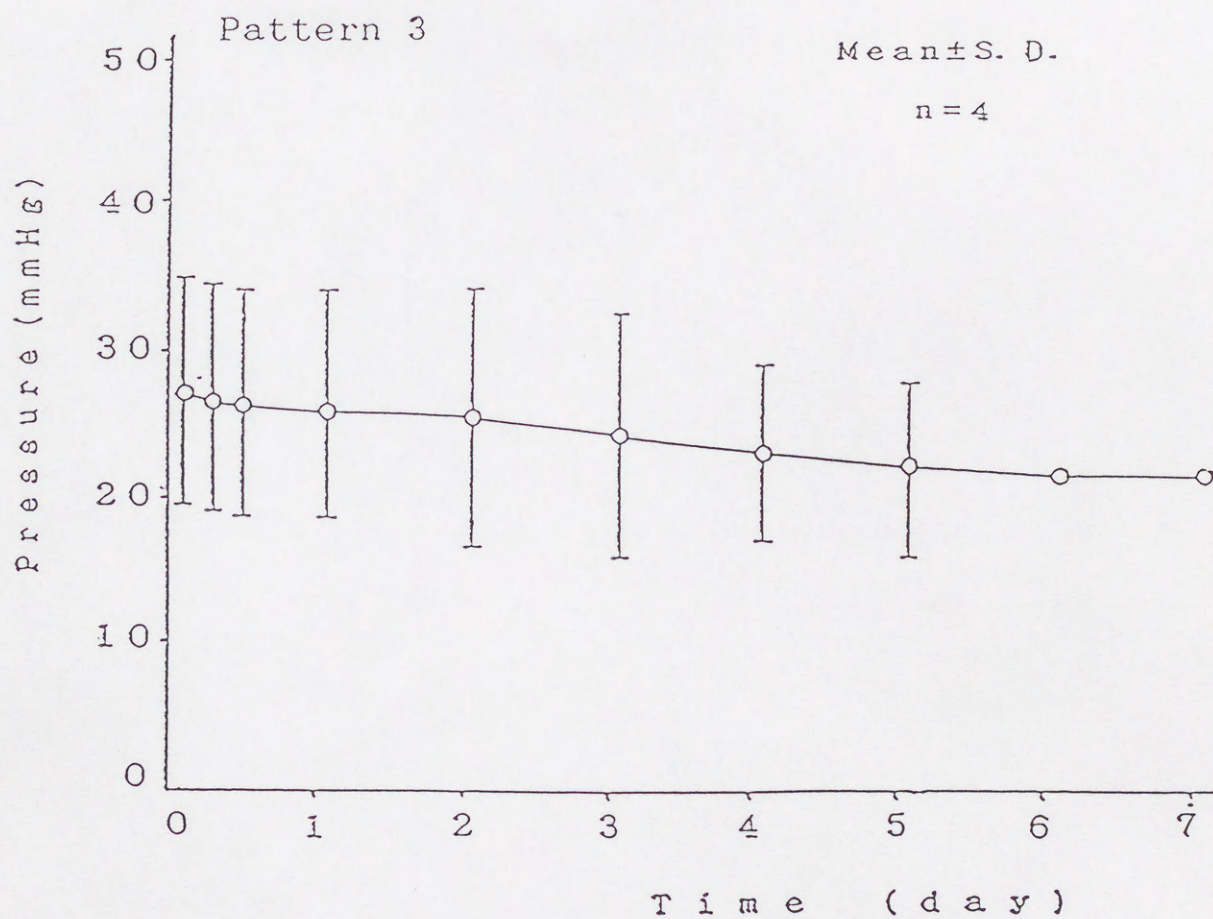


Fig. 12 Pattern 3 : Pressure continued during the whole test period.





Fig. 1. Relationship between Time (Days) and Y-axis variable. The Y-axis variable is measured on a scale from 0 to 1.0. The data points are connected by a line, and vertical error bars are shown for each point.