

1

The International Subarachnoid aneurysm Trial (ISAT) 가 가 가

ISAT

(3).

가 60

1. The International Subarachnoid aneurysm Trial (ISAT)

가 가

가

the International Subarachnoid aneurysm Trial (ISAT) 가

(1, 2). ISAT , 가 ,

(primary end point) 1 modified Rankin Scale 3 - 6(dependent or dead)

(trial design)

가 가 1 (dead or dependent) 25%

1994 1996 2002 8 (77%) 가 ,

to - treat basis) 2

가 5

1) 9559 2134 (22.4%)

ISAT

(3).

3615

(39%), 2737 (29%) 가 1064 (11%)

가

가 가

가 가

(50.5%), (32.5%)

ISAT

가

가

1

2003 9 15 2003 9 30

(4).

:

2) ISAT
1070 , 1073
38 , 10
World
Federation of Neurosurgical Disease(WFNS) grade I - III
(4).
가
가
2143 1594 (74%)
23.7%(190/801), 30.6%(243/793)
가
1
가 (p<.001).
(absolute risk reduction)
(30.6 -
23.7) 6.9%
(30.6%) 22.6%(95% CI 8.9% -
34.2%)가
가
5

2002 Lancet 10 26
가
가 ISAT
American Association of Neurological
Surgeon/Congress of Neurological Surgeons(AANS/ CNS)
Section on Cardiovascular Surgery ASITN 6
(R Kerr and A Molyneux, Results from the ISAT
Study, 2003 2 16 - 19, Phoenix)
8.7%,
26.8% 5 - 10
14 23
(1.7)
(1.1 ; p<.0001)
가
가
(26/1048)
1.0%(10/994)
30 26 20
6 30 1
4 30 1
1
CT
subtraction angiography가
3D rotational

2.
?
3000 600 (20%)
가 (Fig. 1).

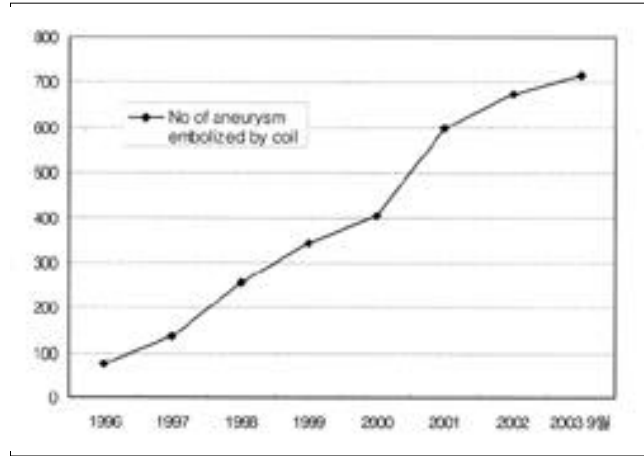


Fig. 1. The increasing tendency in the number of aneurysms embolized by coil in Korea (provided by Boston Scientific Korea).

1)
가
가
ISAT
care 가
2)
ISAT
가
가
가

and 50% (11). 가 ,
가 ,
(5). ISAT 10 mm
가
10 가
group 1 (combined morbidity mortality
)
12.6%, 9.8%
ISAT 가 22.2% . Group 2 (29.7% .
가) 1 match가
10
ISAT (1, 11).
(6). 2) (Giant aneurysm)
(10 mm), (25 mm)
(2.5 mm) (1)
ISAT 가 (level 1 evidence) (7, 8). (2) fusiform ,
(3) (serpentine) (12).
가 5% , 2/3 , 1/3
가 (ophthalmic aneurysm),
70% P1
가 , 가
3. 20 - 70%
1) (Unruptured aneurysm) 50%
International Study of Unruptured Intracranial 2 60% (13).
aneurysm (ISUIA) 가 1998 Lancet Gruber (14). (1)
(9). 가 (anticipated difficulty of surgical
(recruitment and selection clipping of the neck) (22/31, 71%); (2)
bias) 가 (poor grade after haemorrhage) (2/31, 6%); (3)
(age and high medical morbidity
0.05% (0.7%) (2/31, 6%); (4) 가
가 . Rinkel 0.1% (favourable aneurysm morphological features) (5/31, 16%)
1077
7 mm 0%, 7 - 12 mm 0.15% (10). 7
mm ISUIA 가 Lancet 24
5
(5 - year cumulative rupture rates) 2.5%).
7 가
mm , 7 - 12 mm, 13 - 24 mm, and 25 mm
0%, 2.6%, 14.5%, 40%
2.5%, 14.5%, 18.4%,

:

3) wrapping 가 stent (23), (24).
40% . 75% 6 mm 가
(15, 16). 가
(retrobulbar 가
pain) (pupil dilatation) 가
. 5
가
(multilobulated) 가
46% 24 66%가 1 4. (Wide/broad neck aneurysm)
가 (>4 mm) unfavorable
dome - to - neck ratio 가
1 가 (maximum diameter of
aneurysmal sac vs. neck=close to 1)
(25). 85%
15% 가
3 . Soni 10 10
57% 27% (17). 가
가 (18). 가
(26, 27).
(unorganized thrombus)
가 가
(28).
()
(pulsatility) (19).
4) (Dissecting aneurysm) 1) Double microcatheter technique
가 (20).
30% 가 6F envoy guiding catheter 0.067
(21). 가 가 (29).
가 (thromboembolic complication)
가
(21, 22).
(perforator) 가 P1 borad neck

| | |
|--|---|
| <p>3) Balloon - assisted techniques</p> <p>remodelling (25).</p> | <p>5. Surface - modified coils</p> <p>1) Matrix coil</p> <p>(Tissue engineering) Bioabsorbable</p> |
| <p>(side - wall aneurysm)</p> <p>Sentry (Target/Boston Scientific), HyperGlide (Micro Therapeutics) 가 (low compliance) 가</p> | <p>polymeric materials(BPM) 3</p> <p>가</p> <p>polymers polylactid(PLA), polyglycolic acid (PGA) polyglycolic/poly - L - lactic acid copolymer(PLGA)</p> <p>Matrix coil polyglycolic acid (PGLA) PLGA polymer (fibrous tissue)</p> |
| <p>(more compliant) Hyperform (Micro Therapeutics, Irvine, CA) (30).</p> <p>M1 ,</p> | <p>(smooth muscle cell)</p> <p>(scar tissue) (33).</p> <p>14 GDC</p> <p>3, 6 가</p> |
| <p>4) Neck - bridge device - assisted coil packing</p> <p>TriSpan (Target Therapeutics/Boston Scientific, Fremont, Calif) 3 nitinol loop 가 (31).</p> <p>GDC</p> | <p>GDC</p> <p>2) Hydrocoil</p> <p>(50% 가)</p> <p>가 (aneurysm regrowth) (34, 35).</p> |
| <p>5) Stenting across the aneurysm neck</p> <p>self - expanding Neuroform stent (Boston Scientific/Target Therapeutics, Inc., Natick, MA)가 FDA</p> <p>stent nitinol</p> <p>2.5 - 4.5 mm . Radial</p> <p>force 10 mm Hg Radius stent(Boston Scientific, Natick MA)가 36 mm Hg, Precise Stent (Cordis Endovascular, Miami Lakes, FL)가 140 mm Hg</p> | <p>(28, 36).</p> <p>Hydrogel 가 가 (37).</p> <p>GDC</p> |
| <p>(32). stent</p> | <p>20% to 30%</p> <p>Hydrocoil 68%</p> <p>Hydrogel</p> |
| <p>stent</p> <p>Renegade HI - FLOW</p> <p>braided microcatheter(Boston Scientific/Target Therapeutics) preload</p> | <p>Hydrocoil(MicroVention, Inc.)</p> <p>hydrogel .</p> <p>hydrogel 9 가</p> <p>Hydrogel</p> |
| <p>stent</p> <p>stent</p> <p>4 mm</p> <p>stent 10 - 20 mm가 Foreshortening 1.8 - 5.4%</p> | <p>Hydrogel 5 5</p> <p>20 . 0.010 inch</p> <p>0.035 inch . 1 cc</p> <p>3) Radioactive P³²</p> |

70%가 1 mm (38, 39). P32 beta

6. (vascular spasm) 17 - 40%

(Fisher grade III - IV) (65)

4 - 10 가 Treggieri - Venzi (40), (superoxide free radical formation)

가 (nitric oxide) kinase

C 가 prostaglandin prostaglandin E2

가 Ferrous hemoglobin

endothelin 1 가 cyclic GMP

serotonin, fibrin degradation products, thrombin, iron, catecholamines, vasopressin, angiotensin 가 - filament 가 protein kinase C kinase kinase myosin light chain dephosphorylation kinase C

가 (blood - brain barrier)

L - type voltage - gated calcium channels Nimodipine

(41).

4 60 mg 21 가 (hypervolemia), (hypertension), (hemodilution) HHH (triple H) M1

Papaverine

CT

Verapamil

1 -

2 mg

7.5 mg

(42).

가

가

가

가

가

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