

## 26. 慢性期—頸動脈内膜剥離術(CEA) (橋本)

### 勧告 (ガイドライン)

- a 症候性頸動脈高度狭窄では、抗血小板療法を含む optimal medical care に加えて、手術及び周術期管理に熟達した施設において頸動脈内膜剥離術を行うことが推奨される (グレード A)。
- b 症候性頸動脈中等度狭窄では、抗血小板療法を含む optimal medical care に加えて、手術及び周術期管理に熟達した施設において頸動脈内膜剥離術を行うことが推奨される (グレード B)。
- c 無症候性頸動脈高度狭窄では、抗血小板療法を含む optimal medical care に加えて、手術及び周術期管理に熟達した施設において頸動脈内膜剥離術を行うことが推奨される (グレード B)。
- d 症候性頸動脈軽度狭窄あるいは無症候性中等度乃至軽度狭窄における頸動脈内膜剥離術を推奨する根拠は明らかではなく、その適応は症例の特殊な事情に応じて検討すべきである (グレード C)。

### エビデンス

狭窄率 50%以上 (NASCET) すなわち高度ないし中等度の症候性頸動脈狭窄病変対しては、内科的治療 (抗血小板療法を含む optimal medical care) + 頸動脈内膜剥離術と内科的治療単独とを比較すると前者の方が脳卒中再発予防効果が優れている<sup>1-11)</sup> (II)。とりわけ 70%以上 (NASCET) の症候性頸動脈狭窄病変では、双方の治療効果に関する差はより明らかである<sup>1-3)</sup> (I-II)。なお、狭窄率の判定法については study により差異があり、ECST では NASCET で評価するより狭窄率が高く判定される傾向にある<sup>12,14-16)</sup>。

狭窄率 50%未満 (NASCET) の症候性頸動脈軽度狭窄病変あるいは無症候性中等度ないし軽度狭窄病変に対して頸動脈内膜剥離術を推奨する根拠は明らかではない<sup>8,10,12,13)</sup>。

狭窄率 60%以上 (ACAS) の無症候性頸動脈狭窄病変に対しては、内科的治療 (抗血小板療法を含む optimal medical care) + 頸動脈内膜剥離術と内科的治療単独とを比較すると前者の方が脳卒中再発予防効果が優れている<sup>16-24)</sup> (II)。ただし、無症候性狭窄に対する頸動脈内膜剥離術の適応には 3%以下の低い合併症発生率で治療できるという高い水準が要求される<sup>18)</sup>。

NASCET: North American Symptomatic Carotid Endarterectomy Trial

ECST: European Carotid Surgery Trial

ACAS: Asymptomatic Carotid Atherosclerosis Study

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## 27. 慢性期—angioplasty と stenting (橋本)

### 勧告 (ガイドライン)

- a transluminal angioplasty / stenting を推奨する根拠は明らかではなく、その適応は症例の特殊事情に応じて検討すべきである (グレード C)。

### エビデンス

transluminal angioplasty / stenting についての報告は現在進行中の randomized controlled trial もあるが結果が未発表で<sup>1-3)</sup>、その他は case series の evidence level にとどまっており、勧告を行うための十分な資料がない (V)。

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## 28. 慢性期—EC-IC bypass (小川)

### 勧告 (ガイドライン)

- a EC-IC bypass 術に関しては脳虚血症状再発の面からは、症候性内頸動脈および中大脳動脈閉塞あるいは狭窄症など広い疾患範囲で検討すると EC-IC bypass 術を施行することを考慮してもよいが十分な科学的な根拠はない (グレード C)。
- b しかし、上記疾患でもアセタゾラミドに対する脳血流増加率が低下している症例や PET 上、脳酸素摂取率が亢進している症例では、脳虚血症状再発が有意に多く (グレード C)、今後、EC-IC bypass 術は上記疾患における脳循環代謝量を有意に改善する可能性が期待される (グレード C)。
- c 脳虚血症状再発の面からは、症候性椎骨脳底動脈閉塞性病変に対して EC-IC bypass 術 (浅側頭動脈上小脳動脈吻合術) を施行することを考慮してもよいが十分な科学的な根拠はない (グレード C)。

### エビデンス

症候性内頸動脈および中大脳動脈閉塞あるいは狭窄症を全般にわたってみると、脳虚血症状再発に関し、バイパス術は薬物療法単独と比べ有効であるというエビデンスはない<sup>1-3)</sup> (II)。しかし、アセタゾラミドに対する脳血流増加率が低下している症例、あるいは PET 上、脳酸素摂取率が亢進している症例では、脳虚血症状が有意に再発しやすい<sup>4,5)</sup> (IV)。またバイパス術はこれらの脳循環代謝量を有意に改善する<sup>6)</sup> (IV)。現在、アセタゾラミドに対する脳血流増加率が低下している症例でバイパス術の有効性を検討する共同研究が進行中である<sup>7)</sup> (II)。

症候性椎骨脳底動脈閉塞性病変においては、薬物療法 (ワーファリンあるいはアスピリン) のみは高い確率で脳虚血症状再発をきたす<sup>8)</sup> (III)。症候性椎骨脳底動脈閉塞性病変においては、バイパス術 (浅側頭動脈上小脳動脈吻合術) は低下している脳循環代謝を改善し脳虚血症状再発を予防する可能性はあるが<sup>9,10)</sup> (V)、エビデンスはない。

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## 29. 急性期リハビリテーション（眞野）

### 勧告（ガイドライン）

- a 臨床的に安定している場合で重度から中等度の機能障害を認める患者では早期から集中的なリハビリテーションプログラムを順次離床から自立へ進めることが推奨される（グレードA）。

付記：脳卒中患者のリハビリテーション開始時には脳卒中の病型や病態、合併症を含めた全身状態とともに機能障害、能力障害、社会的不利を評価する必要がある。臨床的に不安定な場合はリハビリテーションの開始時期を検討したり、心肺機能などをモニターする必要がある。発症直後からベッドサイドで開始することがあるが、廃用症候群の予防とセルフケアの早期自立が目標である。急性期リハビリテーションには早期座位・立位、装具を用いた早期歩行訓練、摂食・嚥下訓練、セルフケア訓練などがある。リハビリテーション開始後には深部静脈血栓症、血圧の変動、不整脈、心不全、誤嚥、褥瘡、転倒、てんかん、高血糖、低栄養、尿路感染症などに注意する。患者や家族には機能予後や合併症とともに現在の治療について説明し、健康増進や再発予防、今後のライフスタイル、介護方法やホームプログラム、利用可能で必要となる福祉資源などを教育・指導する。

### エビデンス

中等度以上の機能障害を認める患者に対して早期から1日当たりの訓練をより多く行くと、早期離床につながり脳卒中発症3ヵ月後の機能障害やADL障害を改善させる<sup>1-6)</sup> (I-II)。また中等度以上の上肢麻痺に対して通常の訓練に加えて神経筋電気刺激を行うと、筋萎縮を予防し機能回復につながる<sup>7)</sup> (II)。重度の運動障害や半盲あるいは半側注意力障害を認める患者に対して通常の訓練に加えて感覚運動刺激を行うと運動障害を改善し注意力を向上させる<sup>8)</sup> (II)。

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## 30. 慢性期リハビリテーション（眞野）

### (1) 運動障害

#### 勧告（ガイドライン）

##### a 歩行訓練

慢性期において歩行能力を改善させるための下肢筋力強化と歩行訓練は推奨される（グレードA）。

##### b バイオフィードバック

筋収縮や関節アライメントの再教育に筋電図バイオフィードバックあるいは角度バイオフィードバックを用いた訓練は推奨される（グレードA）。

##### c 機能的電気刺激

重度の運動障害に対して通常の訓練に追加して機能的電気刺激を行うことは上下肢の筋力を増強し歩行能力や上肢運動機能を改善させるので推奨される（グレードA）。

##### d 痙縮

痙縮に対して dantrolene sodium は推奨される（グレードA）。また高頻度の経皮的電気刺激（TENS）を痙縮の抑制のために行うことは推奨される（グレードB）。局所神経ブロック療法としてフェノールブロックやアルコールブロックは推奨されるが十分な科学的根拠はない（グレードC）。さらにボツリヌス毒素（保険適応外）によるブロックは推奨される（グレードB）。顕著な痙縮に対して baclofen の髄注（保険適応外）は推奨される（グレードB）。

##### e 上肢機能訓練

日常的に麻痺側上肢の使用を促すことや課題を含む積極的な訓練プログラムを繰り返すことは推奨される（グレードA）。

付記：慢性期のリハビリテーションにおいてまず最初に脳卒中による機能障害や能力障害を評価しその予後予測を行う。そして本人や家族と面接し合意を得て、居住環境の調整を含めた将来計画を立てる。

運動障害は筋力低下、運動失調、筋緊張異常、持久力低下の程度により日常生活動作（ADL）において様々な能力障害をもたらす。その運動障害に対する訓練には筋力増強訓練、持久力訓練（エルゴメーターやトレッドミルなど）、関節可動域訓練、巧緻性訓練、歩行訓練、バランス訓練、ADL訓練などがある。必要に応じて装具療法により機能障害を代償することを考慮する。

活動性が上昇すれば転倒する危険性が増加する。覚醒度を低下させる薬剤の処方に注意し居住環境の改善で転倒を減少させる。大腿骨頸部骨折の予防にプロテクターを装着することがある。

不活動性に起因する廃用症候群は筋力低下、関節可動域制限、異所性骨化などを引き起こす。廃用症候群は麻痺側だけでなく非麻痺側にも生じる。廃用症候群を予防するために活動性を維持向上させる目的意識を持たせ、関節可動域訓練や自動運動などの訓練を行う。

### エビデンス

慢性期の集注的な下肢筋力強化や歩行訓練は歩行能力を改善させる<sup>1)</sup> (II)。慢性期脳卒中に筋電図バイオフィードバックは足関節背屈筋力の改善<sup>2)</sup> (I)、神経筋再教育のための手段として有効<sup>3)</sup> (I) であるが、関節可動域の回復には有効でない<sup>4)</sup> (I)。また角度バイオフィードバックを用いた訓練は膝過伸展に対して有効である<sup>5)</sup> (II)。重度の運動障害に対して機能的電気刺激を行うと上下肢の筋力を増強し歩行能力や上肢運動機能を改善させる<sup>6,7)</sup> (I-II)。Dantrolene sodium は痙縮に対して有効である<sup>8)</sup> (II)。痙縮に対して低頻度の経皮的電気刺激（TENS）は効果がない<sup>9)</sup> (II) が高頻度のTENSは8週間で痙縮の改善を認める<sup>10)</sup> (II)。

ボツリヌス毒素治療は上肢<sup>11)</sup> (II) や下肢<sup>12)</sup> (II) の痙縮に有効である。顕著な痙縮に対して baclofen の髄注は有意な効果を認め、長期投与で効果は継続する<sup>13)</sup> (II)。慢性期軽度から中等度の片麻痺患者に対して非麻痺側上肢を拘束して麻痺側上肢を強制使用すること<sup>14)</sup> (II) や多くの課題を含む積極的な訓練プログラム<sup>15)</sup> (II) で麻痺側上肢の機能が改善する。

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## (2) 脳高次機能障害

### 勧告（ガイドライン）

#### a 失語

脳卒中後の失語でのコミュニケーション障害に対してコミュニケーション能力を改善する目的の訓練は推奨される（グレードB）。

#### b 認知障害

半側空間無視に対して視覚的 cue を与えて訓練することや健側視野を遮蔽することあるいはフレスネルプリズムを使用することは推奨される（グレードB）。

付記： 脳高次機能障害には言語障害や失行・失認・半側空間無視・注意力障害・記憶障害などがある。言語障害は標準失語症検査などにより重症度の評価を行い、コミュニケーション手段を検討する。失語の場合にはコミュニケーション手段を確保する必要があり、構音障害の場合には運動療法的構音訓練がされる。その他の脳高次機能障害はまずスクリーニング検査を行い、必要に応じてさらに詳しい検査で評価する。この認知障害に対しては障害された機能を反復訓練したり、代償できる手段を検討する。

また脳卒中後のうつ状態は運動障害や認知障害に影響するので、リハビリテーション施行時にその病態の鑑別は重要である。脳卒中後のうつ状態に対して病態を鑑別した後で抗うつ薬や中枢神経刺激剤が投与されたり、精神的サポートや家族指導が行われる。

### エビデンス

脳卒中後の失語に対する言語療法ははっきり効果があるかどうか明確な根拠はない<sup>1)</sup> (I)。半側空間無視に対して視覚的 cue を与えて訓練すると機能的予後は改善する<sup>2)</sup> (II)。半側空間無視に対して両側視野の右半分遮蔽すると機能的予後が改善する<sup>3)</sup> (II)。半側空間無視に対してフレスネルプリズムを装着するとADLは4週間後の改善しないが空間無視が改善する<sup>4)</sup> (II)。

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### (3) 嚥下障害

#### 勧告（ガイドライン）

- a 嚥下障害を認める場合、機能を評価し患者や家族に対して嚥下指導を行うことは推奨される（グレードA）。
- b 嚥下不能の場合、経皮内視鏡的胃瘻増設術（PEG）は経鼻胃管栄養より推奨される（グレードB）。

付記：嚥下障害では誤嚥の危険があり、ビデオ X 線透視検査などによる嚥下機能を評価する。嚥下障害に対しては食物を利用した直接訓練、食物を利用しない間接訓練、嚥下と呼吸の協調による呼吸訓練などがある。

#### エビデンス

嚥下障害を認める場合、患者や家族に対して食事の工夫や代償的嚥下技術を教育・指導すると脱水や肺炎を予防できる<sup>1)</sup> (II)。経皮内視鏡的胃瘻増設術は経鼻胃管栄養より死亡率を減少させ、栄養状態を改善させると報告されているが現在大規模研究が進行中である<sup>2)</sup> (I)。

- 1) Depippo KL, Holas MA, Reding MJ, Mandel FS, Lesser ML: Dysphagia therapy following stroke: A controlled trial *Neurology*. 44 (9): 1655-1660, 1994
- 2) Bath PMW, Bath FJ, Smithard DG: Interventions for dysphagia in acute stroke (Cochrane Review) *Cochrane Database Syst Rev*. 1999

#### (4) 疼痛・浮腫

##### 勧告（ガイドライン）

- a 肩関節の疼痛に対して通常の経皮的電気刺激（TENS）の効果に関して十分な科学的根拠がない（グレードC）。
- b 肩関節の疼痛に対してテーピングによる固定は推奨できない（グレードD）。
- c 肩関節の疼痛に対してステロイドの関節注射の長期的効果に関しては十分な科学的根拠がない（グレードC）。
- d 上肢の浮腫に対して間欠的圧迫治療は推奨できない（グレードD）。

付記：脳卒中後の上肢に浮腫や肩関節の疼痛に対しては消炎鎮痛薬・低用量ステロイド・抗うつ薬（アミトリプテン）・メキシレチンの内服、局所麻酔薬やステロイドの注射、消炎鎮痛薬の貼布、温熱療法、三角巾装着などが試みられる。

##### エビデンス

肩関節の疼痛に対して肩関節周囲の電気刺激で疼痛に効果があるかどうか明確な証拠はない<sup>1,2)</sup> (I)。肩関節のテーピング固定は疼痛や関節可動域の改善に有効でない<sup>3)</sup> (II)。ステロイド（triamcinolone acetonide）の関節注射は3週間後の疼痛改善には有効でない<sup>4)</sup> (II)。上肢の浮腫に対して間欠的圧迫治療は有効でない<sup>5)</sup> (II)。

- 1) Price CI, Pandyan AD: Electrical stimulation for preventing and treating post-stroke shoulder pain. *Cochrane Database Syst Rev.* (4): CD001698, 2000
- 2) Leandri M, Parodi CI, Corrieri N, Rigardo S: Comparison on TENS treatments in hemiplegic shoulder pain. *Scand J Rehabil Med.* 22: 69-71, 1990
- 3) Hanger HC, Whitewood P, Brown G, Ball MC, Harper J, Cox R, Sainsbury R: A randomized controlled trial of strapping to prevent post-stroke shoulder pain *Clin Rehabil.* 14 (4): 370-380, 2000
- 4) Snels IAK, Beckerman H, Twisk JWR, Dekker JHM, de Koning P, Koppe PA, Lankhorst GJ, Bouter LM: Effect of triamcinolone acetonide injections on hemiplegic shoulder pain. A randomized clinical trial *Stroke.* 31 (10): 2396-2401, 2000
- 5) Roper TA, Redford S, Tallis RC: Intermittent compression for the treatment of the oedematous hand in hemiplegic stroke: a randomized controlled trial. *Age Ageing.* 28 (1): 9-13, 1999

##### その他の参考文献

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