A literature-based comparison of three methods of pediatric esophageal coin removal

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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
Paediatric esophageal coin removal using endoscopic, Foley catheter or bougienage coin removal techniques.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Children undergoing esophageal coin removal.

Setting
Hospital. The economic study was conducted in New York, USA.

Dates to which data relate
Cost dates were not explicitly stated. Effectiveness data were obtained through a literature search that included papers on esophageal coin removal published between 1975 and 1996.

Source of effectiveness data
Effectiveness data were derived from a synthesis of previously published studies.

Modelling
Success rates and costs were entered into a decision analytic model using Decision Analysis by TreeAge (TreeAge Software, Inc, Boston, MA).

Outcomes assessed in the review
The number of attempted and successful esophageal coin removal procedures by method (endoscopy, Foley catheter, or bougienage), and the number of complications associated with each method were assessed.

Study designs and other criteria for inclusion in the review
All studies included in the review were retrospective case series. Searches were limited to papers published in English involving human subjects. Also, the following criteria were used for inclusion in the review:

(1)To best reflect the conditions relevant to current American physicians, only papers from the USA, Canada, Western
Europe and Australia published since 1975 were included.

(2) The number of children with esophageal coins who underwent attempted coin removal by endoscopy, Foley catheter removal, or bougienage, and the methods' success rates could be determined.

(3) Complications were reported; and

(4) To eliminate their potential bias, single case reports were excluded.

Sources searched to identify primary studies
The MEDLINE and HEALTH computer databases (1975-1996) were searched, as well as the entire CINAHL computer database.

Criteria used to ensure the validity of primary studies
To eliminate their potential bias, single case reports were excluded.

Number of primary studies included
24 papers met the criteria for the literature search.

Methods of combining primary studies
Meta-analysis.

Investigation of differences between primary studies
Not performed.

Results of the review
The success rates of esophageal coin removal procedures were as follows:

- endoscopy, attempted = 1,005, successful = 1,005, complications = 25;
- Foley catheter, attempted = 658, successful = 618, complications = 12;
- bougienage, attempted = 83, successful = 83, complications = 0.

Measure of benefits used in the economic analysis
The authors did not provide a summary measure of benefits.

Direct costs
The total charges per patient were calculated by the hospital's billing department. These included all hospital and physician care, including ED use, radiology charges and operating room charges. A charge for endoscopy after unsuccessful bougienage or Foley catheter removal attempts was also calculated. Cost dates were not stated. Quantities and costs were not reported separately.

Statistical analysis of costs
Not performed.
Indirect Costs
Not considered.

Currency
US dollars ($).

Sensitivity analysis
Sensitivity analyses were carried out varying probabilities of success and patient charges associated with each of the procedures.

Estimated benefits used in the economic analysis
Not applicable.

Cost results
The expected cost of endoscopic coin removal was $2,701, of Foley catheter removal was $660 and of bougienage removal was $614.

Synthesis of costs and benefits
Not applicable.

Authors' conclusions
In a literature based decision analytic model, pediatric esophageal coin removal by the Foley catheter or bougienage technique was far more effective than was endoscopy.

CRD COMMENTARY - Selection of comparators
The reason for the choice of the comparators (endoscopy, Foley catheter, and bougienage) is clear, as all were used in the authors' setting. You, as a database user, should consider if the same applies to your own setting.

Validity of estimate of measure of benefit
The authors systematically searched the literature to identify all relevant studies.

Validity of estimate of costs
Adequate details of the methods of cost estimation were given and no important items appear to have been omitted.

Other issues
The authors acknowledged that the most notable disadvantage of their modelling technique was its dependence on imperfect literature: publication bias, and a reluctance to publish unfavourable results, may have limited the number of failed procedures that were reported.

Implications of the study
This study clearly justifies further objective research, ideally a prospective randomised trial of the various methods of esophageal coin removal.
Source of funding
None stated.

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