Cost comparison between two modes of Palmaz Schatz coronary stent implantation: transradial bare stent technique vs transfemoral stent technique

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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
Palmaz Schatz coronary stent implantation, either by transradial bare stent technique, or by transfemoral sheath-protected stent technique.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients requiring stent implantation. The transradial group had a mean age of 62 years and were 86% male. The transfemoral stent group had a mean age of 57, and 84% were male.

Setting
Hospital. The economic study was performed at the Amsterdam Department of Interventional Cardiology-OLVG, Amsterdam, the Netherlands.

Dates to which data relate
Effectiveness and resource use data were derived from the study of patients treated in the transradial bare stent group in 1993 and patients treated in the transfemoral stent group between 1991 and 1993. It seems that costs were expressed in 1994 values.

Source of effectiveness data
Effectiveness data were derived from a synthesis of two studies conducted at the same hospital.

Outcomes assessed in the review
Side effects (cardiac, non-cardiac) and patient mobility were measured as primary health outcomes. The length of hospitalization was also measured as a proxy for clinical outcome.

Study designs and other criteria for inclusion in the review
Data for the transfemoral bare stent treatment were from a randomized controlled study, the Benestent study. Data for patients undergoing transradial artery stent implantation were from an observational case-series study. The two groups were treated at the same centre.
Sources searched to identify primary studies
Not stated.

Criteria used to ensure the validity of primary studies
Not stated.

Methods used to judge relevance and validity, and for extracting data
Not stated. Raw data were extracted from the primary studies.

Number of primary studies included
Two observational studies were included in the synthesis, one for each procedure.

Methods of combining primary studies
The studies were not combined, since only one study per procedure was included.

Investigation of differences between primary studies
Differences in baseline clinical characteristics between the two study population have been reported. Characteristics of the Benestent patients were more favourable.

Results of the review
Patients in the transradial group were not restricted to bed rest unlike patients in the transfemoral group. Two patients in the transfemoral group needed emergency repeat PTCA followed by coronary bypass surgery for subacute stent thrombosis, whilst no patients in the transradial group had cardiac complications. A total of 7 patients in the transfemoral group required diagnostic procedure as a direct consequence of non-cardiac complications compared to 2 patients in the other group. More patients in the transfemoral group needed blood transfusions than those in the transradial group (4 versus 0, p=0.026). 7 vascular interventions were necessary in the transfemoral group compared to none in the transradial group (p=0.009). Patients in the transradial group were discharged earlier (6.4 +/- 4.7 SD days) than patients in the transfemoral group (11.6 +/- 9 SD days), (p=0.005).

Measure of benefits used in the economic analysis
Health benefits were measured as the presence of side-effects and the level of patients mobility.

Direct costs
Some costs and quantities were reported separately. Direct health service costs were used. Costs included the material costs for each procedure, utilization charges for personnel and equipment, and charges for each day of hospital stay. Because of lack of information, catheterization laboratory resource usage could not be included in the analysis. Post-procedure laboratory assessment costs were not taken into account because they were considered to be protocol-driven. The year to which the cost data relate was not stated.

Statistical analysis of costs
Median values and confidence intervals were reported for some costs.

Currency
Dutch guilders (Dfl).
Sensitivity analysis
No sensitivity analysis was carried out.

Estimated benefits used in the economic analysis
The following health benefits were reported: Patients in the transradial group were not restricted to bed rest unlike patients in the transfemoral group. Two patients in the transfemoral group needed emergency repeat PTCA followed by coronary bypass surgery for subacute stent thrombosis, while no patients in the transradial group had cardiac complications \( p > 0.05 \). A total of 7 patients in the transfemoral group required diagnostic procedure for noncardiac complications compared to 2 patients in the other group. More patients in the transfemoral group needed blood transfusions as a result of bleeding complication than patients in the transradial group \( (4 \text{ versus } 0, p=0.026) \). Patients in the transradial group were discharged earlier \( (6.4 +/- 4.7 \text{ SD days}) \) than patients in the transfemoral group \( (11.6 +/- 9 \text{ SD days}) \), \( p=0.005 \).

Cost results
Total costs per patient in the transradial group were Dfl 9,409.19 \( (\text{SD: 3,665.35}) \), whilst the corresponding figure for the transfemoral group was Dfl 14,045.91 \( (\text{SD: 2,498.31}) \). The implied savings associated with the former procedure were thus Dfl 4,636.72. (If costs for repeat PTCA and emergent bypass surgery in the transfemoral group are not taken into account, the transradial technique still leads to a 22% cost reduction.)

Synthesis of costs and benefits
Since the transradial stent technique was the dominant strategy, costs and benefits were not combined.

Authors' conclusions
Transradial coronary bare stent implantation is cheaper than the traditional transfemoral stent technique, reduces the incidence of entry-site related complications, and leads to shorter hospitalization.

CRD Commentary
The authors reported that there were differences in baseline clinical characteristics between the two study populations; patients in the transfemoral stent group having more favourable characteristics. This was a difference which was likely to lead to stronger results in the direction already observed. The data associated with the two stent techniques were collected in different years. In the intervening period stent technology had become cheaper and safer and this could have led to bias and overestimation of the advantages of the transradial bare technique. The analysis of a more comprehensive range of costs (such as laboratory, pharmacological, and nursing care costs) would also have improved the study validity.

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